The Objective-Item Bank presented covers 16 sections of four subject areas in each of four grade levels. The four areas are: Language Arts, Math, Social Studies, and Science. The four grade levels are: Primary, Intermediate, Junior High, and High School. The Objective-Item Bank provides school administrators with an initial starting point for curriculum development and with the instrumentation for program evaluation, and offers a mechanism to assist teachers in stating more specifically the goals of their instructional program. In addition, it provides the means to determine the extent to which the objectives are accomplished. This document presents the Objective Item Bank for intermediate science. (CK)
INTERMEDIATE SCIENCE

BEHAVIORAL OBJECTIVES AND TEST ITEMS

EVALUATION FOR INDIVIDUALIZED INSTRUCTION

A Title III ESEA project
administered by
Downers Grove, Illinois
School District 99

1400 West Maple Avenue
Downers Grove, Illinois 60515
Phone: 312-971-2040

Primary
Intermediate
Junior High
High School


X

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INTERMEDIATE SCIENCE

BEHAVIORAL OBJECTIVES AND TEST ITEMS

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Evaluation for Individualized Instruction Project
AN ESEA TITLE III PROJECT
Administered
by
Downers Grove Public School District 99
BEHAVIORAL OBJECTIVE - TEST ITEM BANK

BACKGROUND

The Evaluation for Individualized Instruction Project, an ESEA Title III project administered by the Downers Grove, Illinois, School District 99, has developed an Objective-Item Bank covering sixteen sectors of four subject areas in each of four grade levels.

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<th>Subject Area</th>
<th>LA</th>
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LA = Language Arts
MA = Math
SS = Social Studies
SC = Science

1 = Primary
2 = Intermediate
3 = Junior High
4 = High School

Nearly 5000 behavioral objectives and over 27,000 test items based on these objectives were recently published as the culmination of this three-year project. The complete output of seventeen volumes totals over 4500 pages. These publications have been reproduced by the Institute for Educational Research to make them available at cost to teachers and administrators.

The objectives and items were written by over 300 elementary and secondary teachers, representing forty Chicago suburban school districts, who participated in workshops of three to nine weeks duration throughout the project. In these workshops they learned to write effective behavioral objectives and test items based on the objectives. The results of their work were edited for content and measurement quality to compile the largest pool of objectives and test items ever assembled.

PRINCIPLES AND MERITS

Unfortunately, the Objective-Item Bank is often viewed mainly as a source of test items. Although this is an important function, its greatest potential impact lies not in the availability of a multitude of test items, but rather in the ability of these items to measure carefully selected educational goals.

The almost frenetic search for test items on the part of some educators has been spurred by the current emphasis on measurement. Some educators have become so enamored with measurement that they seem more interested in obtaining a numerical index than examining what they are really trying to measure. Further, it is
not unusual for teachers to speak about a child obtaining a score of 95% on a particular test. Frequently, they encounter considerable difficulty in interpreting the real meaning of a score and are content to just accept its numeral value. A much more important question would seem to be: What are our goals of measurement? Unless we can answer this question precisely, the only real purpose that testing serves is to gather data concerning pupils to facilitate the marking of report cards. This is not to say that this function is not legitimate - it is rather to say that such a view of measurement is much too constricting. The goal of measurement should be to provide feedback both to the teacher and the child regarding the success or failure of the learning experiences in realizing specifically stated objectives.

One of the main strengths of the EII Objective and Item Bank is that all the items are directly tied to specifically stated objectives. Each group of items is designed to measure a specific objective and therefore provides the means whereby the teacher can obtain feedback on the success of the educational program.

It is disheartening to observe so many districts attacking the complex problem of curriculum development independently. One cannot help reflecting on the mammoth duplication of efforts involved. The Objective-Item Bank offers a possible alternative to this duplication. Utilizing its resources, the curriculum committee is provided with some point of departure. The efforts of three hundred teachers participating in the Evaluation Project's workshops and the thoughts of forty districts can be evaluated and utilized. This is not to suggest that any set of objectives should be viewed as the "answer" to an individual district's curricular problem but rather the efforts of others offer a convenient point of departure and may serve to stimulate diverse opinions about the direction of curricular thrust within the individual district. The words of Sir Isaac Newton seem appropriate; "If I have seen further, it is by standing upon the shoulder of giants." The efforts of others, whether we consider them giant-like or pygmyish, do offer a threshold to view the immense, complicated problem of curricular development in better perspective.

The title of an article in a recent educational journal, "If You're Not Sure Where You're Going, You're Liable to End up Someplace Else," succinctly describes a continuing dilemma in our educational system. The vagueness of our goals often promotes the idea that "anything goes." Without a guiding beacon many classrooms become activity-centered rather than goal-oriented. One educator recently compared the all-too-typical classroom with Henry Ford's observation concerning history. He defined history as, "One damned thing after another." Is this true of the succession of activities within our classrooms? Does the teacher really know the educational purpose of each activity? Perhaps, even more importantly, do the children know the purpose?

The Objective-Item Bank offers a mechanism to assist teachers in stating more specifically the goals of their instructional program and further provides the means to determine the extent to which the objectives are accomplished. The specification of goals assists the teacher in discovering whether favored activities advance learning, or are merely time fillers; whether they get the "materials" across, or are merely perfunctory exercises.
Much discussion has been devoted to the topic of "individualized instruction?" and occasionally some dialogue has even centered on the "how." But an even more basic question is one that is often ignored: "Individualize what?"

Many school districts mention their individualized programs in reading or mathematics. What is individualized within these programs? Are certain skills definitely identified? Is the practice of protesting to determine the child's level of proficiency when he enters the program a guideline?

The Objective-Item Bank has two potential contributions to make to all school districts embarking on or presently engaged in individualized instruction programs. These contributions are: 1. A group of well-specified objectives which could form the "what" of the program. 2. A set of items designed to provide information on the degree of mastery of the objective.

APPLICATIONS AND TECHNIQUES

The versatility of the Objective-Item Bank is evident in its value and usability by both teachers and administrators.

To the Administration the Objective-Item Bank:

1. Provides an initial starting point for curriculum development. The existence of many objectives avoids the necessity of each district duplicating the efforts of another. The task of the curriculum committee becomes one of selecting and/or rejecting objectives from the Objective-Item Bank and then supplementing them with objectives developed at the local level. Test-participants of the Evaluation Project workshops would be valuable resource people in this endeavor.

2. Provides the instrumentation for program evaluation. The selection of items from those objectives representative of the main emphases of the local district provides the framework for the evaluation of the stated goals.

To the Teacher the Objective-Item Bank:

1. Provides the pooling of talent and imagination of teachers of varied experience and interests, thus avoiding the present duplication of effort.

2. Provides resources for more highly sensitized program evaluation instead of a battery of standardized tests. Since the objectives are tailored to the program, the associated test items can be used to determine precisely the efficacy of the instructional materials.

3. Provides the means whereby the teacher can become more acutely aware of that which he is seeking to have occur in his classroom and that which he will accept as evidence of its occurrence. Hopefully, as teachers become more aware of their goals, they will share these
objectives with children and let the pupils become acutely aware of
that which is expected of them, ergo allowing them to seek their own
modality of instruction for the realization of the stated goals.

4. Provides the nucleus of an individualized instruction program.
   a. It provides for more precise curriculum planning by differenti-
      ating those goals specific to each grade and even to each
      student. With the bank at their disposal, teachers are encour-
      aged to become aware of their responsibilities in developing a
      set of basic objectives which every child must attain and a
      further set which can be pursued according to the students'
      abilities and interests.
   b. It provides several items per objective, some of which may be
      used as a pre-test to discover whether a student should under-
      take that objective while the remainder may be employed to
      measure the mastery of those students who do tackle the objective.

NOTES

Several of the volumes have been reproduced from punched cards by the IBM 407,
a machine which does not print all characters exactly as they appear on a type-
writer. Thus:

% is actually ( )
π is actually )
O is actually ? or !
Apostrophes cannot be printed.

The number immediately after the statement of each objective represents the
number of items measuring attainment of that objective.

Information on the EII publications or purchase requests can be directed to:

INSTITUTE FOR EDUCATIONAL RESEARCH
1400 West Maple Avenue
Downers Grove, Illinois 60515
CHARACTERISTICS OF BODY SYSTEMS

THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF THE DIFFERENCES BETWEEN ORGANS AND SYSTEMS BY IDENTIFYING CHARACTERISTIC STATEMENTS APPROPRIATE TO EACH.

CHOOSE THE CORRECT ANSWER.

AN ORGAN IS MADE UP OF A NUMBER OF
A. SYSTEMS
B. JOINTS
C. BONES
* D. TISSUES

THE HEART AND LUNGS ARE
*A. ORGANS
B. SYSTEMS
C. CELLS
* D. TISSUES

A NUMBER OF ORGANS WORKING TOGETHER FORM A
A. CELL
B. TISSUE
*C. SYSTEM
D. SKELETON

THE STOMACH IS ONE OF THE ORGANS OF YOUR DIGESTIVE
A. GLAND
B. SET
*C. SYSTEM
D. CELL

********************

THE STUDENTS SHOULD IDENTIFY ANY OF THE SIX SYSTEMS FROM A DESCRIPTION OF THE SYSTEM.

CHOOSE THE CORRECT ANSWER.

NUTRIENTS AND OXYGEN ARE CARRIED BY WHICH OF THE FOLLOWING SYSTEMS?
A. NERVOUS
B. RESPIRATORY
*C. CIRCULATORY
D. SKELETAL

THE TWO SYSTEMS WHICH ASSIST *MOST* IN THE PROCESS OF MOVEMENT ARE
A. CIRCULATORY AND RESPIRATORY
*B. MUSCULAR AND SKELETAL
C. MUSCULAR AND CIRCULATORY
D. SKELETAL AND RESPIRATORY

WHICH SYSTEM IS ENTIRELY MADE UP OF BONE?
*A. SKELETAL SYSTEM.
THE MOUTH, THROAT AND ABDOMINAL REGION OF THE BODY COMPRIS A PART OF THE
A. NERVOUS SYSTEM.
B. EXCRETORY SYSTEM.
*C. DIGESTIVE SYSTEM.

THE STUDENT WILL RECOGNIZE THE INTER-RELATEDNESS OF HUMAN SYSTEMS BY DETERMINING CAUSATIVE RELATIONSHIPS.

1. A MALFUNCTION OF THE EXOCRINE GLANDS WOULD MOST AFFECT
   *A. DIGESTION.
   B. HEART RATE.
   C. HEARING.
   D. GROWTH.

2. WHICH TWO SENSES ARE MOST CLOSELY RELATED?
   *B. TASTE AND SMELL
   C. TOUCH AND FEEL
   D. SIGHT AND TASTE
   E. HEARING AND TOUCH

3. YOUR SENSE OF BALANCE WOULD MOST LIKELY BE HURT IF WHICH OF THESE SENSES WAS DAMAGED?
   *C. TOUCH
   D. SMELL


   SOLID PIECES OF FOOD ARE BROKEN UP BY THE
   *C. TEETH
FOOD. THESE ARE CALLED THE **** GLANDS.  
A. CHEAT  
*B. SALIVARY  
C. THYROID  
D. ADRENAL  

THE FLUID SECRETED BY THE GLANDS WHICH MOISTEN THE FOOD IS CALLED  
A. PERSPIRATION.  
B. THYROXIN.  
C. ADRENAL.  
*D. SALIVA.  

THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF THE DIGESTIVE PROCESS BY SELECTING THE SEQUENCE IN WHICH THE BREAKDOWN OF PROTEINS TAKES PLACE IN THE STOMACH.  

CHOOSE THE CORRECT ANSWER.  

PROTEINS ARE TEMPORARILY STORED IN THE STOMACH WHERE FURTHER DIGESTION TAKES PLACE. AFTER THIS  
A. THE BREAKDOWN OF PROTEINS BEGINS WITH THE AID OF THE GASTRIC JUICE CALLED PANCRATIC JUICE.  
*B. THE ENZYME PEPSIN FOUND IN THE GASTRIC JUICE BEGINS THE BREAKDOWN OF PROTEINS.  
C. THE GASTRIC JUICE CONTAINS AMYLASE WHICH BEGINS THE BREAKDOWN OF PROTEINS.  
D. LIPASE AN ENZYME FOUND IN THE GASTRIC JUICE BEGINS THE BREAKDOWN OF PROTEINS.  

THE STUDENT WILL DEMONSTRATE HIS ABILITY TO UNDERSTAND THE PROCESS OF DIGESTION BY SELECTING WHAT HAPPENS IN GIVEN ORGANS AND PARTS.  

CHOOSE THE CORRECT ANSWER.  

THE ESOPHAGUS IS THE  
A. WINDPIPE.  
*B. FOOD PIPE.  
C. CELL MEMBRANE.  
D. SALIVA.  

IN THE STOMACH FOOD IS  
*A. PARTLY DIGESTED.  
B. STORED FOR LATER USE.  
C. COMPLETELY DIGESTED.  
D. SENT TO ALL PARTS OF THE BODY.  

IN THE SMALL INTESTINE FOOD IS  
*A. COMPLETELY DIGESTED.  
*B. PARTLY DIGESTED.  
C. STORED FOR LATER USE.  
D. MOISTENED FOR EASIER MOVEMENT.  

THE LARGE INTESTINE STORES
B. STORED FOR LATER USE.
C. JUICES TO AIDE IN DIGESTION.
D. FOOD YOU CANNOT DIGEST.

JUICES WHICH HELP BREAK DOWN FOOD ENTER INTO THE
A. LIVER AND STOMACH.
B. SMALL INTESTINE AND LARGE INTESTINE.
C. STOMACH AND SMALL INTESTINE.
D. PANCREAS AND LIVER.

************************************************************

THE STUDENT CAN DEMONSTRATE KNOWLEDGE OF THE DIGESTIVE SYSTEM
BY IDENTIFYING CHANGES WHICH OCCUR IN THE PROCESS OF DIGESTION.

CHOOSE THE CORRECT ANSWER.

TO BE ASSIMILATED INTO THE BLOOD STREAM FOOD MUST
A. BE BROKEN INTO SMALLER PIECES.
B. BE BROKEN DOWN CHEMICALLY.
C. BE MIXED WITH WATER.
D. ENTER THE LARGE INTESTINE.

WHAT ROLE DOES THE SALIVARY ENZYME PLAY IN THE DIGESTIVE
PROCESS?
A. CHANGES SUGAR TO STARCH
B. CHANGES PROTEIN TO FATS
C. CHANGES STARCH TO SUGAR
D. CHANGES PROTEIN TO AMINO ACIDS

GASTRIC JUICES OF THE STOMACH BEGIN THE CHANGE OF
A. PROTEINS TO AMINO ACIDS.
B. FATS TO FATTY ACIDS.
C. STARCH TO SUGAR.
D. CARBOHYDRATES TO PROTEINS.

THE LIVER PRODUCES BILE WHICH START THE DIGESTION OF
A. PROTEINS TO AMINO ACIDS.
B. STARCH TO SUGAR.
C. SUGAR TO STARCH.
D. FAT TO FATTY ACIDS.

************************************************************

THE STUDENT CAN DEMONSTRATE KNOWLEDGE OF THE DIGESTIVE SYSTEM
BY DIFFERENTIATING THE VARIOUS FUNCTIONS PERFORMED BY STRUCTURES
WITHIN THE DIGESTIVE SYSTEM.

DIRECTIONS - GIVEN A LIST OF PARTS OF THE DIGESTIVE SYSTEM,
IDENTIFY WHETHER THE PART SERVES A MECHANICAL, A CHEMICAL FUNCTION, IS A GLAND, OR ACTS TO ABSORB FOOD INTO THE BLOOD STREAM.
PLACE THE APPROPRIATE LETTER OPPOSITE THE PART LISTED.

M. MECHANICAL
C. CHEMICAL
G. GLAND
A. ABSORBER OF FOOD
THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF HOW THE SHAPES OF PARTS OF THE DIGESTIVE SYSTEM REGULATES THE FUNCTIONS OF THE SYSTEM BY SELECTING THE TERM OR PHRASE WHICH BEST COMPLETES THE STATEMENT.

CHOOSE THE CORRECT ANSWER.

FOODS TAKEN INTO THE BODY MUST BE CHANGED TO A SIMPLE FORM BECAUSE

A. THEY ARE TOO LARGE TO MOVE THROUGH THE DIGESTIVE ORGANS.
B. THEY ARE TOO COMPLEX FOR THE CELLS TO USE.
C. SO THAT PHOTOSYNTHESIS CAN TAKE PLACE.
D. SO PERISTALSIS CAN OCCUR IN THE DIGESTIVE ORGANS.

THE ESOPHAGUS CONVEYS FOOD TO THE STOMACH EASILY DUE TO ITS SHAPE WHICH IS

A. CIRCULAR OPENING.
B. COILED TUBE.
C. STRAIGHT TUBE.
D. BAG-LIKE.

IT WOULD NOT BE POSSIBLE FOR DIGESTION TO OCCUR IF IT WERE NOT FOR THE MUSCULAR CONTRACTIONS CALLED

A. PERISTALSIS.
B. OSMOSIS.
C. ABSORPTION.
D. REFLEX ACTION.

THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF THE DIGESTIVE PROCESS BY SELECTING THE CORRECT SEQUENCE OF EVENTS IN DIGESTION.

CHOOSE THE CORRECT ANSWER.
FOOD HAS BEEN IN THE MOUTH FOR A SHORT TIME. IT IS SWALLOWED AND PULLED INTO THE ESPHAGUS, FROM THERE IT IS FORCED

*A. BY PERISTALSIS INTO THE STOMACH.
B. INTO THE STOMACH AND THEN PUSHED BY PERISTALSIS INTO THE ESPHAGUS.
C. DIRECTLY INTO THE LIVER WITH THE AID OF PERISTALSIS AND THEN INTO THE TRACHEA.
D. INTO THE BRONCHIAL TUBES AND FROM THERE FORCED INTO THE STOMACH BY PERISTALSIS.

THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF THE SENSES OF SIGHT AND HEARING, BY COMPLETING SENTENCES ON HOW THE PARTS OF EACH FUNCTION EFFECTIVELY.

CHOOSE THE CORRECT ANSWER.

1. WHEN NERVE ENDINGS OF THE EYE ARE STIMULATED, MESSAGES OR IMPULSES ARE SENT ALONG THE NERVE CELLS TO THE
   A. EYE BALL.
   B. PUPIL.
   C. BRAIN.
   D. EYE LID.

THE NERVE ENDINGS SENSITIVE TO LIGHT ARE LOCATED AT THE
   A. BACK.
   B. FRONT.
   C. SIDE.
   D. BOTTOM.

2. WHEN THE BRAIN INTERPRETS IMPULSES FROM THE OPTIC NERVE, YOU ARE ABLE TO
   A. HEAR.
   B. SEE.
   C. SMELL.
   D. TASTE.

A VIBRATING OBJECT PRODUCES
   A. SOUND.
   B. SMELL.
   C. SIGHT.
   D. TOUCH.

THE INNER EAR RECEIVES SOUND PRODUCING VIBRATIONS THROUGH THE AID OF THE FUNNEL EFFECT OF THE
   A. AUDITORY NERVE.
   B. OUTER EAR.
   C. OPTIC NERVE.
   D. EARDRUM.

******************************************************************************
THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF THE SENSES – SMELL, TASTE AND TOUCH BY SELECTING THE REACTION OF THESE SENSES TO A STIMULUS.

CHOOSE THE CORRECT ANSWER.

THROUGH THE USE OF THE FIVE DIFFERENT KINDS OF NERVE ENDINGS IN YOUR SKIN, YOU DEVELOP THE SENSE OF
*A. FEELING.
B. SEEING.
C. HEARING.
D. SMELLING.

AFTER YOU COME IN CONTACT WITH AN ODOR FOR SEVERAL MINUTES, THE SENSITIVITY OF THE NERVE ENDINGS INSIDE THE NOSE
*A. REMAINS THE SAME.
B. BECOMES GREATER.
C. INCREASES GREATLY.
*D. BECOMES LESS.

YOU WOULD NOT BE ABLE TO DIFFERENTIATE BETWEEN FOODS IF IT WERE NOT FOR THE LOCATED ON YOUR TONGUE.
*A. RIDGES
B. PORES
*C. TASTE BUDS
D. PAPILLAE

RESPIRATORY SYSTEM

THE STUDENT WILL RECALL THE ORGANS OF THE RESPIRATORY SYSTEM AND THEIR FUNCTION BY RECOGNITION OF DEFINITIONS.

CHOOSE THE CORRECT ANSWER.

FILTERING, WARMING, AND MOISTENING OF AIR ARE THE THREE MAIN FUNCTIONS OF THE
*A. BRONCHIAL TUBES.
B. ALVEOLI.
*C. NASAL PASSAGES.
D. TRACHEA.

INHALATION BRINGS FRESH OXYGEN INTO THE BODY, WHILE THE PROCESS OF EXHALATION REFERS TO THE REMOVAL OF WASTE AND VAPOR.
*A. CARBON MONOXIDE, SULFUR
*B. CARBON DIOXIDE, WATER
*C. CALCIUM HYDROXIDE, WATER
D. SODIUM CHLORIDE, WATER

THE TRACHEA MAY ALSO BE CALLED THE
*A. WINDPIPE.
B. BRONCHI.
C. NASAL PASSAGES.
D. PHARYNX.
THE TRACHEA BRANCHES INTO TWO TUBES CALLED
A. LUNGS.
*B. BRONCHI.
C. NASAL PASSAGES.
D. LARYNX.

CARBON DIOXIDE THAT IS PRODUCED THROUGHOUT YOUR BODY IS CARRIED IN THE BLOOD TO YOUR
A. PHARYNX.
B. LARYNX.
C. TRACHEA.
*D. LUNGS.

YOUR BODY IS BRINGING IN OXYGEN AND REMOVING CARBON DIOXIDE
A. SOME OF THE TIME.
*B. ALL THE TIME.
C. ONLY AS YOU SLEEP.
D. WHILE YOU ARE AWAKE.

AS YOU BREATHE OXYGEN INTO YOUR BODY, YOUR RIBS MOVE
A. UPWARD AND OUTWARD.
B. DOWN AND OUT.
C. UPWARD AND INWARD.
D. OUTWARD AND INWARD.

*****************************************************************

CIRCULATORY SYSTEM

THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF BLOOD
BY SELECTING THE CORRECT RESPONSE IN A GIVEN SITUATION.

READ THE PARAGRAPHS BELOW. BASED ON WHAT YOU KNOW ABOUT BLOOD
CHOOSE *A* FOR REASONABLE, OR *B* FOR UNREASONABLE.

JACK DOES NOT FEEL WELL SO HE GOES TO THE DOCTOR. THE DOCTOR TAKES A SAMPLE OF JACK'S BLOOD. THE DOCTOR FINDS THAT THERE IS A LARGE AMOUNT OF WHITE BLOOD CELLS IN JACK'S BLOOD.

JACK IS NOT SICK. *B
JACK NEEDS MORE PLASMA. *B
JACK HAS AN INFECTION. *A
JACK NEEDS MORE WHITE BLOOD CELLS. *B
JACK DOES NOT HAVE RED BLOOD CELLS. *B
PLASMA CAN BE EASILY MOVED FROM ONE PLACE TO ANOTHER. *A
BEFORE IT IS USED, WATER MUST BE ADDED TO PLASMA. *A
PLASMA CAN SAVE PEOPLE'S LIVES. *A
PLASMA MUST BE USED QUICKLY OR IT WILL SPOIL. *B
DRIED PLASMA CONTAINS RED AND WHITE BLOOD CELLS. *B

CHOOSE THE CORRECT ANSWER.

BLOOD CARRIES TO ALL PARTS OF THE BODY
* A. FOOD AND OXYGEN
   B. FOOD AND CARBON DIOXIDE
   C. OXYGEN AND CARBON DIOXIDE
   D. CARBON DIOXIDE AND PLASMA

SOME BLOOD CELLS ARE MADE IN THE
* A. PLASMA
   B. BLOOD VESSELS
   C. HEMOGLOBIN
   D. MARROW

THE RED COLOR OF BLOOD COMES FROM THE
* A. PLASMA
   B. BLOOD VESSELS
   C. HEMOGLOBIN
   D. MARROW

RED BLOOD CELLS WEAR OUT AT THE RATE OF
* A. 30 MILLION PER MINUTE
   B. 7 THOUSAND PER SECOND
   C. 3 MILLION PER SECOND
   D. 5 MILLION PER MINUTE

ONE KIND OF WHITE BLOOD CELL IS A
* A. DRIFTER
   B. GERM EATER
   C. PLASMA GROWER
   D. MARROW EATER

PUS IS MADE UP OF
* A. DEAD RED BLOOD CELLS AND PLASMA
   B. DEAD GERMS AND RED BLOOD CELLS
   C. DEAD PLASMA AND WHITE BLOOD CELLS
   D. DEAD WHITE BLOOD CELLS AND GERMS

PLASMA IS THE
* A. WHITE COLOR OF WHITE BLOOD CELLS
   B. DIGESTED FOOD IN THE BLOOD
   C. LIQUID PART OF THE BLOOD
   D. IRON IN YOUR BLOOD.
IDENTIFY WHETHER THE PART IS CONCERNED WITH THE DISTRIBUTION OF OXYGENATED BLOOD OR WITH BLOOD CARRYING IMPURITIES, WHETHER IT ASSISTS IN CLEANING THE BLOOD OR SERVES AS A CONNECTIVE NETWORK. PLACE THE LETTER OF THE APPROPRIATE RESPONSE NEXT TO THE PART LISTED.

A. OXYGENATED BLOOD
B. UNPURE BLOOD
C. CLEANS THE BLOOD
D. CONNECTIVE NETWORK

CAPILLARIES
LEFT VENTRICLE
RIGHT AURICLE
KIDNEY
VEINS
LEFT AURICLE
LUNGS
RIGHT VENTRICLE
ARTERIES
HEMOGLOBIN

NERVOUS SYSTEM

THE STUDENT CAN APPLY KNOWLEDGE OF THE ACTION OF A STIMULUS ON THE SENSORY, CONNECTING, OR MOTOR NEURONS BY IDENTIFYING THE FUNCTION OF EACH IN A UNIQUE SITUATION.

THE ACTION OF A STIMULUS ON A CONNECTING NEURON IS *MOST* LIKE
A. A RECEIVER ACCEPTING THE INITIAL STIMULUS.
B. A TRANSMITTER SENDING OUT THE INITIAL STIMULUS.
C. A SWITCHBOARD DIRECTING THE STIMULUS TO A MUSCLE OR GLAND.
D. AN AMPLIFIER WHICH STRENGTHENS THE ORIGINAL STIMULUS.

DAMAGE TO THE SPINAL CORD MAY RESULT IN PARALYSIS BECAUSE
A. THE SENSORY NEURONS ARE DAMAGED AND CAN NO LONGER RECEIVE A STIMULUS.
B. THE CONNECTING NEURONS ARE DAMAGED AND CANNOT DIRECT A STIMULUS FURTHER.
C. THE MOTOR NEURONS ARE DAMAGED, AND WILL NOT PERMIT THE MUSCLES TO FUNCTION.
D. ALL REFLEX ACTIONS OF THE BODY CEASE TO FUNCTION.

A CHEMICAL SUBSTANCE IS SECRETED INTO THE BODY BY GLANDS, THE ADRENALS. THE ADRENAL GLANDS INCREASE THEIR ACTION WHEN
A. WE ARE NERVOUS.
B. WE ARE STIMULATED.
   a. THE MOTOR NEURON CARRIES AN IMPULSE TO THE GLANDS.
D. THE SENSORY NEURON CEASES TO FUNCTION.

******************************************************************************
THE STUDENT WHEN PRESENTED WITH AN EXAMPLE, WILL BE ABLE TO
IDENTIFY WHICH TYPE OF LEARNING IS INVOLVED BY CLASSIFYING
SITUATIONS AS INSTINCT, REFLEX, CONDITIONED RESPONSE, OR GOAL
INSIGHT. %7b

A YOUNG CAT WAS PLAYING WITH A BALL OF YARN IN THE YARD WHEN
A SQUIRREL RAN UP A TREE. THE CAT RAN AFTER THE SQUIRREL. THE
CAT'S OWNER CALLED HIM, TOLD HIM TO COME DOWN AND HE DID.

THE CAT CLIMBING UP THE TREE IS AN EXAMPLE OF WHICH KIND OF
LEARNING?
   A. CONDITIONED RESPONSE
   B. GOAL-INSIGHT
   C. INSTINCT
   D. REFLEX

THE CAT COMING BACK DOWN IS AN EXAMPLE OF
   A. INSTINCT.
   B. CONDITIONED RESPONSE.
   C. REFLEX.
   D. GOAL - INSIGHT.

A FIRST GRADER WAS WATCHING HIS BROTHER PLAYING BALL. HIS
BROTHER HIT A HOME RUN AND WAS GIVEN A TROPHY. THE LITTLE BOY
DECIDED HE WANTED TO BE A BASEBALL PLAYER TOO.

THE OLDER BROTHERS HITTING THE BALL IS AN EXAMPLE OF
   A. INSTINCT.
   B. CONDITIONED RESPONSE.
   C. GOAL - INSIGHT.
   D. REFLEX.

THE LITTLE BOY DECIDING TO BECOME A BALL PLAYER IS AN EXAMPLE
OF
   A. GOAL - INSIGHT.
   B. REFLEX.
   C. INSTINCT.
   D. CONDITIONED RESPONSE.

SUE HAS AN AQUARIUM IN HER ROOM WITH THREE GOLDFISH IN IT. SHE
WANTED TO TRAIN THE FISH TO COME TO THE TOP BUT COULDN'T. ONE DAY
SHE TAPPED THE TANK WHILE FEEDING THE FISH AND THEY CAME TO EAT.
AFTER THAT, SHE ALWAYS TAPPED THE TANK WHEN SHE FED THEM.

READ THE PARAGRAPH BELOW AND CHOOSE THE MAIN IDEA FROM THE
ALTERNATIVES GIVEN.

THE FISH COMING TO EAT WHEN SUE TAPPED THE GLASS IS AN EXAMPLE OF
   A. GOAL - INSIGHT.
   B. REFLEX.
   C. INSTINCT.
   D. CONDITIONED RESPONSE.

SUE *DECIDING* TO TAP THE GLASS WHEN SHE FED THE FISH IS
SUE SHAKING HER HAND AFTER ACCIDENTALLY HITTING THE TANK THE
FIRST TIME IS AN EXAMPLE OF
A. INSTINCT.
B. REFLEX.
C. CONDITIONED RESPONSE.
D. GOAL - INSIGHT.

THE STUDENT WILL COMPREHEND THE NEED FOR RIBS BY STUDYING THE
LOCATION OF THE HEART AND LUNGS IN A DIAGRAM OF BASIC BODY ORGANS
AND SELECTING THE POSSIBLE FUNCTIONS OF THE RIBS. %2p

CHOOSE THE CORRECT ANSWER.

THE RIBS AND BREASTBONE FORM A CAGE AROUND THE
A. HEART AND LUNGS.
B. HEART AND LOWER INTESTINE.
C. LUNGS AND BRAIN.
D. LUNGS AND STOMACH.

THE BACKBONE AND BREASTBONE ARE CONNECTED THROUGH PAIRS OF
A. 8
B. 10
C. 12
D. 14

THE STUDENT WILL ANALYZE HOW CLOSELY THE ARM, HAND AND SHOULDER
WORK TOGETHER BY SELECTING THE MOST PROBABLE OUTCOME OF HYPOTHE-
TICAL VARIETIES IN A BONE. %1p

CHOOSE THE CORRECT ANSWER.

IF YOUR ARM JUST RFLOW THE ELBOW IS BROKEN, A CAST WILL BE
PLACED ON THE BODY
A. ABOVE THE ELBOW ONLY.
B. ON THE WRIST ONLY.
C. ABOVE THE ELBOW TO THE WRIST.
D. ON THE SHOULDER BLADE.

THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF THE PROTECTIVE
FEATURES OF THE SKULL BY SELECTING THE FEATURES THAT WOULD PRO-
TECT AGAINST INJURY IN A GIVEN SITUATION. %2p
CHOOSE THE CORRECT ANSWER.

THE SKULL PROVIDES A DEFINITE SHAPE TO THE
A. FOOT.
* B. HEAD.
C. HAND.
D. CHEST.

SHOULD THE PERSON BE HIT ON THE EAR OR NOSE HIS SKULL WOULD BE PROTECTED BY A FLEXIBLE SUBSTANCE CALLED
*A. CARTILAGE.
B. CARPALS.
C. BONE.
D. VERTEBRA.


CHOOSE THE CORRECT ANSWER.

THE ENTIRE SKELETON PROVIDES OVER-ALL SUPPORT OF THE BODY WHILE THE BOWL-LIKE SHAPE OF THE HIP BONES SERVES AS A SUPPORT FOR
A. ORGANS IN THE CHEST CAVITY.
B. RESPIRATORY ORGANS.*
C. ABDOMINAL ORGANS.
D. CIRCULATORY ORGANS.

THE GENERAL SHAPE OF YOUR BODY IS PRODUCED BY THE SKELETON, WHILE THE WIDTH OF YOUR HIPS IS PRODUCED BY THE WIDTH OF WHICH BONES?
A. COLLAR
B. RIBS
C. FOOT
*D. HIP

WHILE THE HANDS AND ARMS MAY SWING FREELY FOR A PERSON STANDING UPRIGHT, THE NUMEROUS BONES FOUND IN THE FEET AND TOES MUST BE PLACED ON THE GROUND COMPLETELY WHILE WALKING IN ORDER TO MAINTAIN
A. BALANCE
B. DIRECTION
C. FLEXIBILITY
D. SPEED

AS A RESULT OF EXPERIMENTING WITH AND EXAMINING BONES, THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF THE CHARACTERISTICS OF BONE TISSUE AND STRUCTURE BY SELECTING CORRECT OUTCOMES FROM EXPERIMENTAL SITUATIONS.

CHOOSE THE CORRECT ANSWER.

IN ITS NATURAL STATE, A BONE WHEN RENT WILL
**A. BREAK INTO 2 OR 3 PIECES**
**B. CURVE TO A U SHAPE**
**C. RETURN TO ITS ORIGINAL SHAPE**
**D. REMAIN RENT**

AFTER PLACING A BONE IN THE DILUTED HYDROCHLORIC ACID, IT NO LONGER CONTAINS THE HARD SUBSTANCE CALLED:

* A. LEAD
* B. IRON
* C. CALCIUM
* D. COPPER

WHEN A BONE IS BROKEN THE HARD OUTSIDE LAYER BREAKS VERY EASILY WHILE THE INSIDE HAS:

* A. A SOFTER MATERIAL THAT REQUIRES A GREAT DEAL OF PRESSURE TO BREAK
* B. A HARD MATERIAL THAT REQUIRES A LIGHT TAP TO BREAK
* C. A HARD MATERIAL THAT REQUIRES A GREAT DEAL OF PRESSURE TO BREAK
* D. A SOFT MATERIAL THAT WILL REND RATHER THAN BREAK INTO SEVERAL PIECES

************THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF THE KINDS OF BONE FRACTURES AND THEIR TREATMENT BY CHOOSING FROM A LIST THE TREATMENT OR TYPE OF INJURY.************

CHOOSE THE CORRECT ANSWER.

1. A FRACTURED LIMB CAN BE IMMOBILIZED THROUGH THE USE OF:
   * A. STILTS
   * B. SPLINTS
   * C. A Tourniquet
   * D. Antiseptic

2. A FRACTURED BONE MAY BE DETECTED WHEN A DOCTOR TAKES:
   * A. AN X-RAY
   * B. A PICTURE
   * C. A SLIDE
   * D. A SPECIMEN

3. FRACTURE TYPES MAY EITHER BE:
   * A. SIMPLE OR COMBINATION
   * B. COMPOUND OR COMPLEX
   * C. COMPLEX OR SIMPLE
   * D. SIMPLE OR COMPOUND

************THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE OF BONES BY SELECTING THE CORRECT FUNCTION FOR GIVEN BONES.************

CHOOSE THE CORRECT ANSWER.

1. ONE FUNCTION OF BONES IS TO:
   * A. GROW SKIN
   * B. CARRY FOOD TO ALL PARTS OF THE BODY
   * C. PROTECT DELICATE ORGANS IN THE BODY
   * D. **PROTECT DELICATE ORGANS IN THE BODY**
THE VERTEBRAE OR SPINAL COLUMN IS MADE TO PROTECT THE

* A. NERVES
  B. PELVIS
  C. POINTS
  D. HINGE

BONES ARE CONNECTED SO THAT THEY CAN BEND AND MOVE AT

A. NERVES
B. PELVIS
*C. JOINTS
D. HINGE

BONES MANUFACTURE

* A. BLOOD CELLS
  B. NERVE CELLS
  C. BRAIN CELLS
  D. MUSCLE CELLS

THE TYPE OF JOINT AT THE KNEE IS

A. BALL-AND-SOCKET
*B. HINGE
C. PIVOT
D. SLIDING

THE TYPE OF JOINT AT THE SHOULDER IS

A. SLIDING
B. PIVOT
C. HINGE
*D. BALL-AND-SOCKET

THE BONES ARE NECESSARY TO

A. CARRY FOOD TO CELLS
B. BREATHE OXYGEN
C. CARRY OXYGEN TO CELLS
*D. SUPPORT YOUR BODY

THE HEART AND LUNGS ARE PROTECTED BY THE

A. SKULL
*B. RIBS
C. PELVIS
D. VERTEBRAE

THE STUDENT CAN SHOW HIS KNOWLEDGE OF REPRODUCTION IN PLANTS TO REPRODUCTION IN MAMMALS BY IDENTIFYING THE FUNCTION OF PLANT AND ANIMAL REPRODUCTIVE STRUCTURES OR CELLS.

CHOOSE THE CORRECT ANSWER.

WHICH OF THE FOLLOWING SERVES THE SAME FUNCTION IN PLANT AND ANIMAL REPRODUCTIONS

A. PISTIL
*B. SPERM CELL
THE FUNCTION OF THE EGG CELL IN REPRODUCTION OF PLANTS OR ANIMALS IS TO

A. PRODUCE A HEALTHY PLANT OR ANIMAL.
B. SUPPLY FOOD TO THE EMBRYO.
C. PRODUCE A SEED IN THE OVARY.
D. SUPPLY HALF OF THE CHARACTERISTICS FOR THE OFFSPRING.

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HEALTH

THE STUDENT WILL ANALYZE THE KINDS OF IMMUNITIES TO DISEASES BY SELECTING WHETHER THEY ARE ACTIVE IMMUNITIES, PASSIVE IMMUNITIES, OR CAN'T BE DETERMINED.

CHOOSE THE CORRECT ANSWER.

LONGTIME IMMUNITY FROM SMALLPOX RESULTS FROM HAVING HAD THE DISEASE. THIS IMMUNITY IS

A. ACTIVE
B. PASSIVE
C. CAN NOT BE DETERMINED

LONGTIME IMMUNITY FROM YELLOW FEVER RESULTS FROM HAVING HAD THE DISEASE. THIS IMMUNITY IS

A. ACTIVE
B. PASSIVE
C. CAN NOT BE DETERMINED

IMMUNITY FROM GERMAN MEASLES RESULTS FROM GAMMA GLOBULIN WHICH IS A PROTEIN IN BLOOD PLASMA. THIS IMMUNITY IS

A. ACTIVE
B. PASSIVE
C. CAN NOT BE DETERMINED

SHORT TIME IMMUNITY FROM DIPHTHERIA RESULTS FROM ANTIBODIES PASSED FROM MOTHER TO NEWBORN. THIS IMMUNITY IS

A. ACTIVE
B. PASSIVE
C. CAN NOT BE DETERMINED

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THE STUDENT CAN APPLY HIS KNOWLEDGE OF MICROORGANISMS BY CHOOSING REASONS WHY MAN CAN SURVIVE IN A WORLD OF MICROORGANISMS.

CHOOSE THE CORRECT ANSWER.

SINCE BACTERIA HAVE A FAST RATE OF MULTIPLICATION, THE REASON THEY DON'T TAKE OVER THE WORLD IS

A. THE PEOPLE KILL THEM AS QUICKLY AS THEY MULTIPLY.
B. THE CONDITIONS FOR GROWTH AREN'T ALWAYS IDEAL.
WHEN A MICROORGANISM IS FOUND TO BE RESPONSIBLE FOR A DISEASE,* ONE WAY TO PREVENT SPREAD OF THE DISEASE ON A LARGE SCALE IS TO

*A. LET THE DISEASE RUN ITS COURSE AND HOPE FOR THE BEST.
B. TRY TO DEVELOP A VACCINE TO PREVENT THE SPREAD OF THE DISEASE.
C. ISOLATE THOSE WITH THE DISEASE SO THEY CAN'T CONTAMINATE EVERYONE.

THE STUDENT WILL APPLY THE PRINCIPLES INVOLVED IN THE BODY'S FIGHT AGAINST INFECTION BY IDENTIFYING CAUSATIVE RELATIONSHIPS IN A HYPOTHETICAL SITUATION.

SEVERAL BOYS WERE PLAYING BASEBALL IN THE SCHOOL PLAYGROUND. WHILE ONE BOY WAS RUNNING, HE FELL AND SCRATCHED HIMSELF BADLY. HE GOT UP AND HURRIED TO SECOND BASE, BRUSHED HIMSELF OFF, AND CONTINUED WITH THE GAME. TWO DAYS LATER HIS LEG BECAME INFECTED.

WHAT IS THE FIRST THING HE SHOULD HAVE DONE TO PREVENT THIS?

A. CALL A DOCTOR
B. WASH THE WOUND
C. POUR ON IODINE
D. SPIT ON IT TO CLEAN IT

WHAT IS THE REAL CAUSE FOR THE INFECTION?

A. BACTERIA
B. DIET
C. PLAYING BALL

THE TWO DAY LAPSE PERIOD BEFORE THE INFECTION APPEARED PROBABLY IS DUE TO

A. WEAK BACTERIA
B. BACTERIA GROWTH
C. WHITE BLOOD CELLS
D. POOR CIRCULATION

THE INFECTION IS MADE OF

A. BACTERIA
B. WHITE BLOOD CELLS
C. BOTH A AND B
D. NEITHER A NOR B

WOULD YOU HAVE BEEN SURPRISED THAT THE BOY GOT THE INFECTION? WHY

A. YES
B. NO
C. MAYBE

THE STUDENT WILL DISTINGUISH BETWEEN ANTIBODIES AND ANTISEPTICS, AND ANTIBIOTICS BY MATCHING THE WORD WITH ITS CORRECT DEFINITION.
CHOSE THE CORRECT ANSWER.

**SERM KILLERS PRODUCED INSIDE THE BODY ARE CALLED**
- **A.** Antiseptics.
- **B.** Antibiotics.
- **C.** Antibodies.

**SERM KILLERS PRODUCED BY LIVING MATERIALS OUTSIDE THE BODY ARE**
- **A.** Antiseptics.
- **B.** Antibiotics.
- **C.** Antibodies.

**SERM KILLERS MADE FROM NON-LIVING CHEMICALS ARE**
- **A.** Antiseptics.
- **B.** Antibodies.
- **C.** Antibiotics.

***THE STUDENT WILL APPLY HIS KNOWLEDGE OF THE BODY'S DEFENSE AGAINST INFECTION BY IDENTIFYING WAYS THAT BACTERIA ARE DESTROYED BY THE BODY.***

**CHOOSE THE CORRECT ANSWER.**

BACTERIA ARE IN THE AIR ALL AROUND YOU. THEY LAND ON YOUR SKIN AND ARE TAKEN IN WHEN YOU EAT AND WHEN YOU BREATHE.

THE PRIMARY REASON THAT YOUR LUNGS ARE NOT FILLED WITH DEADLY BACTERIA IS DUE TO
- **A.** White blood cells.
- **B.** Mucus cells.
- **C.** Antibodies.
- **D.** Digestive juices.

AS YOU EAT, BACTERIA FROM THE AIR, YOUR SKIN, AND YOUR MOUTH INFECT YOUR FOOD. THE PRIMARY REASON THAT FOOD DOES NOT PUT MORE BACTERIA IN THE BODY IS DUE TO THE WORK OF
- **A.** Mucus cells.
- **B.** White blood cells.
- **C.** Digestive juices.
- **D.** Antibodies.

WHENEVER YOU CUT OR SCRATCH YOURSELF, BACTERIA GET INTO YOUR BODY. THE PRIMARY REASON THAT CUTS OR SCRATCHES DO NOT CAUSE MORE INFECTION IS DUE TO THE WORK OF
- **A.** Antibiotics.
- **B.** Mucus cells.
- **C.** White blood cells.
- **D.** Digestive juices.
THE STUDENT WILL DISTINGUISH BETWEEN VERTEBRATES AND INVERTEBRATES BY CORRECTLY CLASSIFYING A GIVEN LIST OF CHARACTERISTICS.  

**CHOSE THE CORRECT ANSWER.**

**ALL VERTEBRATES HAVE**
- *A.* BACKBONES.
- *B.* ANTENNÆ.
- *C.* HAIR.
- *D.* LUNGS.

**ALL ANIMALS WITH BACKBONES ARE**
- *A.* INVERTEBRATES.
- *B.* VERTEBRATES.
- *C.* PEOPLE.
- *D.* SKINNY.

**EMPTY SPOOLS ARE STRUNG ON A PIECE OF ROPE TO MAKE A MODEL OF A BACKBONE.** THE SPOOLS STAND FOR
- *A.* THE BRAIN.
- *B.* NERVES.
- *C.* VERTEBRAE.
- *D.* RIBS.

**EMPTY SPOOLS ARE STRUNG ON A PIECE OF ROPE TO MAKE A MODEL OF A BACKBONE.** THE ROPE STANDS FOR
- *A.* THE BRAIN.
- *B.* THE NERVE CORD.
- *C.* BONES.
- *D.* THE NERVOUS SYSTEM.

***THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF THE CLASSIFICATION OF ANIMALS AS VERTEBRATES OR INVERTEBRATES BY PUTTING ANIMALS INTO THEIR PROPER CLASS.*** 

**CHOOSE THE CORRECT ANSWER.**

**WHICH OF THESE IS AN INVERTEBRATE?**
- *A.* TURTLE
- *B.* SNAKE
- *C.* CATERPILLAR
- *D.* LIZARD

**ALL OF THE FOLLOWING ARE VERTEBRATES *EXCEPT* THE**
- *A.* DINOSAUR
- *B.* MOUSE
- *C.* BEETLE
- *D.* MAN

**ALL OF THE FOLLOWING ARE INVERTEBRATES *EXCEPT* THE**
- *A.* STARFISH
- *B.* SFA GULL
- *C.* TAPE WORM
- *D.* SAND DOLLAR

**ALL OF THE FOLLOWING PAIRS OF ANIMALS BELONG TOGETHER *EXCEPT***
- *A.* RABBIT AND MOUSE
- *B.* TURTLE AND CLAM
THE STUDENT WILL DEMONSTRATE A KNOWLEDGE OF THE FIVE CLASSES OF VERTEBRATES BY SELECTING THE CHARACTERISTICS FOR EACH CLASS.

CHOSE THE CORRECT ANSWER.

ANIMALS THAT LIVE PART OF THEIR LIVES IN WATER AND THE REST OF THEIR LIVES ON LAND ARE

A. BIRDS
B. FISH
C. REPTILES
D. AMPHIBIANS
E. MAMMALS

ITS BODY IS COVERED WITH SCALES OR PLATES. IT LAYS ITS EGGS ON LAND. THE EGGS HAVE SOFT SHELLS. IT LIVES ON LAND. IT HAS LUNGS. IT IS

A. A BIRD
B. A FISH
C. A REPTILE
D. AN AMPHIBIAN
E. A MAMMAL

A. IS THE ONLY KIND OF ANIMAL THAT HAS HAIR.

A. BIRD
B. FISH
C. REPTILE
D. AMPHIBIAN
E. MAMMAL

WHICH OF THE FOLLOWING IS *NOT* TRUE OF ALL BIRDS?

A. CAN FLY
B. HAVE FEATHERS
C. HAVE ONE PAIR OF LEGS
D. HAVE LUNGS

WHICH ONE OF THE FOLLOWING IS *NOT* A CHARACTERISTIC OF MAMMALS?

A. THEY LAY EGGS
B. THEY HAVE HAIR
C. THEY HAVE A BACKBONE
D. CAN NURSE THEIR YOUNG

THE STUDENT CAN APPLY THE CONCEPT THAT LIVING THINGS ARE INTERDEPENDENT WITH THEIR ENVIRONMENT BY SELECTING EXAMPLES WHICH SHOW THE RELATIONSHIP.

CHOOSE THE CORRECT ANSWER.

AS FAR AS WE KNOW, THE MOON HAS NO ATMOSPHERE, SURFACE WATER OR PLANTS. THE BEST REASON WHY MAN CANNOT LIVE ON THE MOON AS IT IS, IS THAT

A. ALL LIVING THINGS DEPEND UPON THEIR ENVIRONMENT
B. ALL LIVING THINGS HAVE LIFE ACTIVITIES. THAT IS, THEY MOVE
C. ALL LIVING THINGS HAVE NEEDS.
GROW, AND SO ON.
C. EAT, BOTH PLANTS AND ANIMALS.
D. LIVING THINGS INHERIT CERTAIN CHARACTERISTICS.

IN ORDER TO STAY ALIVE ON THE MOON, SPACE EXPLORERS MUST TAKE CERTAIN THINGS WITH THEM FROM THE EARTH. WHICH OF THE FOLLOWING WOULD THEY *NOT* TAKE?
A. AIR TO BREATHE
B. WATER TO DRINK
*C. SEEDS TO PLANT
D. FOOD TO EAT
E. SPECIAL CLOTHES TO PROTECT THEM FROM THE EXTREME HEAT AND COLD.

A PLANT THAT GROWS IN A HOT, MOIST JUNGLE IS MOVED TO A COLD, DRY PLACE. THE PLANT PROBABLY
A. GROWS BIGGER.
B. GROWS MORE LEAVES.
C. NEEDS MORE AIR.
*D. DIES.

ALL OF THE FOLLOWING SHOW THAT LIVING THINGS DEPEND UPON THEIR ENVIRONMENT *EXCEPT*
A. DINOSAURS HAVE BECOME EXTINCT.
B. FISH MUST LIVE IN WATER.
*C. THE EARTH'S SURFACE HAS CHANGED.
D. SOME PLANTS ARE NOT GREEN.

THE CHILD WILL SHOW AN UNDERSTANDING OF LIVING AND NONLIVING THINGS BY IDENTIFYING THE ESSENTIAL WAYS IN WHICH LIVING THINGS DIFFER FROM NONLIVING THINGS. %44

CHOOSE THE CORRECT ANSWER.

WHICH OF THE FOLLOWING IS TRUE ONLY OF LIVING THINGS?
A. CHANGE IN SHAPE
B. MOVE
*C. REPRODUCE THEIR OWN KIND
D. CHANGE IN SIZE

WHICH OF THESE ITEMS DOES *NOT* COME FROM A LIVING THING?
A. BONES
B. LEAVES
C. WOOD
*D. IRON
E. FEATHERS

WHICH OF THE FOLLOWING *CANNOT* REPRODUCE?
*A. SEA SHELLS
B. ROSEBUSHES
C. ROBINS
D. SNAILS

ALL OF THE FOLLOWING ARE CHARACTERISTICS OF LIVING THINGS *EXCEPT*
A. THEY ARE DIFFERENT FROM THINGS THAT ARE NOT ALIVE.
B. THEY USE AIR, WATER, AND FOOD.
*C. THEY INCLUDE PLANTS AND ANIMALS.
THE STUDENT CAN RELATE THE FUNCTIONS OF A LIVING CELL TO
THE STRUCTURE OF A STANDARDIZED PICTURE OF A CELL.

CHOOSE THE CORRECT ANSWER WHICH DESCRIBES THE STRUCTURE OF A
TYPICAL ANIMAL CELL.

THE LIQUID CONTENTS OF AN ANIMAL OR PLANT CELL EXCLUDING THE
NUCLEUS IS
A. CELL MEMBRANE.
B. CELL WALL.
C. PROTOPLASM.
*D. CYTOPLASM.

THE THIN, SEALED COVERING OF AN ANIMAL CELL IS
*A. CELL MEMBRANE.
B. CELL WALL.
C. PROTOPLASM.
D. CYTOPLASM.

THE BUILDING UNIT OF ALL PLANTS AND ANIMALS IS THE
A. CELL MEMBRANE.
B. CELL WALL.
C. PROTOPLASM.
*D. CELL.

A SMALL, DENSE BODY WHICH CONTROLS THE ACTIVITIES OF A LIVING
CELL IS THE
A. CELL MEMBRANE.
B. CELL WALL.
*C. NUCLEUS.
D. CYTOPLASM.
E. PROTOPLASM.

THE CONTROLLERS OF CELL DIVISION ARE
A. CELL MEMBRANES.
*B. CHROMOSOMES.
C. NUCLEI.
D. VACUOLES.
E. CELL WALLS.

THE LIVING MATERIAL OF A CELL WHICH INCLUDES CELL MEMBRANE,
CYTOPLASM AND NUCLEUS IS
A. CELL MEMBRANE.
B. CELL WALL.
*C. PROTOPLASM.
D. CYTOPLASM.

ALL LIVING THINGS, BOTH PLANT AND ANIMAL, ARE MADE OF
A. CELL WALL.
*B. PROTOPLASM.
C. CELLULOSE.

THE MOST ACTIVE PART OF A CELL IN CELL DIVISION IS THE
A. CELL MEMBRANE.
B. CYTOPLASM.
C. PROTOPLASM.
THE STRUCTURE FOUND IN THE PLANT CELL BUT NOT THE ANIMAL CELL IS THE

A. CELL WALL.
B. NUCLEUS.
C. CELL MEMBRANE.
D. PROTOPLASM.

A GROUP OF CELL TISSUES MAKE UP AN
A. SYSTEM.
B. ORGAN.
C. ORGANISM.

THE STUDENT WILL KNOW THE MEANING OF MICROORGANISM BY SELECTING ITS CORRECT DEFINITION. 

CHOOSE THE CORRECT ANSWER.

A MICROORGANISM CAN BE DEFINED AS A LIVING ORGANISM THAT
A. CAN BE SEEN BY THE NAKED EYE.
B. IS ONLY VISIBLE WITH THE USE OF A MICROSCOPE.
C. IS ONLY VISIBLE DURING CERTAIN STAGES OF GROWTH.
D. CAN BE SEEN ONLY DURING THE DAYTIME.

IF BACTERIA ARE ALLOWED TO GROW WITHOUT CLEANSING A WOUND, IT IS LIKELY THAT
A. THE WOUND WILL HEAL QUICKLY.
B. THE WOUND WILL BECOME INFECTED.
C. THE BACTERIA WILL DIE QUICKLY.

ONE CONDITION NECESSARY FOR FISH TO LIVE IS
A. THEY MUST EAT.
B. THEY MUST BE MOBILE.
C. THEY MUST REPRODUCE.
D. THEY MUST LIVE IN FRESH WATER.

FISH CAN CARRY ON ALL OF THE FOLLOWING FUNCTIONS *EXCEPT*
A. BREATHING
B. MANUFACTURING ITS OWN FOOD.

THE STUDENT CAN APPLY HIS KNOWLEDGE OF MICROORGANISMS BY SELECTING THE EFFECTS OF MICROORGANISMS ON THE BODY.

CHOOSE THE CORRECT ANSWER.

THE STUDENT CAN APPLY HIS KNOWLEDGE ON THE MAINTENANCE OF LIFE AND HOW IT RELATES TO THE FOOD CYCLE OF FISH, BY SELECTING THOSE CONDITIONS THAT ARE NECESSARY FOR THE EXISTENCE OF THIS CYCLE.

CHOOSE THE CORRECT ANSWER.

ONE CONDITION NECESSARY FOR FISH TO LIVE IS
A. THEY MUST EAT.
B. THEY MUST BE MOBILE.
C. THEY MUST REPRODUCE.
D. THEY MUST LIVE IN FRESH WATER.

FISH CAN CARRY ON ALL OF THE FOLLOWING FUNCTIONS *EXCEPT*
A. BREATHING
B. MANUFACTURING ITS OWN FOOD.
THE REMAINS OF DEAD ANIMALS AND PLANTS FALL TO THE BOTTOM OF THE OCEAN. ANIMALS FEED ON THESE REMAINS AND RELEASE MINERALS. WHICH OF THE FOLLOWING EXPLAINS HOW THESE MINERALS ARE PASSED TO THE FISH?

A. THE FISH OBTAIN MINERALS BY SWALLOWING THE OCEAN WATER.
B. THE FISH OBTAIN MINERALS BY EATING SEAWEED WHICH HAS FED ON THE REMAINS.
C. THE FISH OBTAIN MINERALS BY EATING THE REMAINS OF DEAD ANIMALS.
D. NONE OF THE ABOVE.

THE STUDENT WILL DEMONSTRATE COMPREHENSION OF PLANT AND ANIMAL CELL CHARACTERISTICS BY IDENTIFYING STRUCTURES THAT PERTAIN TO EACH TYPE. %3b

CHOOSE THE CORRECT ANSWER.

THE FOLLOWING STRUCTURES ARE FOUND IN BOTH PLANT AND ANIMAL CELLS EXCEPT:
A. CHROMOSOMES.
B. VACUOLES.
C. NUCLEUS.
D. CHLOROPHYLL.

ANIMAL CELLS DO NOT HAVE A
A. CELL WALL
B. CELL MEMBRANE.
C. NUCLEUS

PLANT CELLS ARE ABLE TO MAKE THEIR OWN FOOD BECAUSE THEY POSSESS
A. CHROMOSOMES.
B. CELL WALL.
C. CHLOROPHYLL.
D. CYTOPLASM.

THE STUDENT WILL DEMONSTRATE KNOWLEDGE OF THE PARTS OF THE CELL MATCHING A FUNCTION WITH A CORRESPONDING CELL PART. %4d

CHOOSE THE CORRECT ANSWER.

EVERY CELL HAS PARTS FOR STORING MATERIAL. THESE ARE
A. MITOCHONDRIA.
B. NUCLEI.
C. VACUOLES.
D. MEMBRANES.

THE PART OF PLANT CELLS WHICH GIVES IT SHAPE IS THE
A. CELL WALL.
B. CYTOPLASM.
C. CHROMOSOMES.
D. VACUOLES.
THE CHROMOSOMES ARE FOUND IN THE
A. PROTOPLASM
*B. NUCLEUS
C. GENES
D. VACUOLES

THE PART OF THE CELL WHICH DETERMINES THE CELLS HEREDITY IS
A. CELL WALL
B. PROTOPLASM
C. NUCLEUS
*D. GENES

THE STUDENT WILL DEMONSTRATE A KNOWLEDGE OF INSECTS BY SELECTING FACTS PERTINENT TO THEIR PARTS, GROWTH, AND ADAPTABILITY.

CHOOSE THE CORRECT ANSWER.

WHICH OF THE FOLLOWING IS **NOT** ONE OF THE PARTS OF AN INSECT?
A. HEAD
*B. FINS
C. THORAX
D. ABDOMEN

WHICH OF THESE IS AN INSECT?
A. SPIDER
B. CENTIPEDE
*C. CRICKET
D. TICK

WHICH OF THE FOLLOWING IS **NOT** TRUE OF **ALL** INSECT?
A. SIX LEGS
B. THREE BODY PARTS
*C. OUTSIDE SKELETONS
D. WINGS

THE BUTTERFLY IS AN INSECT THAT GROWS IN FOUR STAGES. THESE STAGES, **IN ORDER**, ARE
*A. EGGS, LARVAE, PUPAE, ADULTS
B. EGGS, NUMPHS, PUPAE, ADULTS
*C. ADULTS, EGGS, PUPAE, NYMPHS
D. EGGS, PUPAE, LARVAE, ADULTS

THE GRASSHOPPER GROWS IN THREE STAGES. WHICH OF THE FOLLOWING IS **NOT** ONE OF THE STAGES?
A. NYMPH
*B. PUPAE
C. ADULT
D. EGG

WHICH OF THESE IS **NOT** ANOTHER NAME FOR THE LARVAL STAGE?
A. WORM
*B. MAGGOT

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INSECTS
THE RESTING STAGE OF AN INSECT IS CALLED THE STAGE.

WHAT IS THE *MAIN* REASON WHY A NYMPH MOLTS?

WHICH OF THESE IS *NOT* A SPECIAL WAY INSECTS HAVE FOR SURVIVING?

THE STUDENT WILL SHOW A KNOWLEDGE OF SOCIAL INSECTS BY SELECTING CHARACTERISTICS THAT PERTAIN TO THEIR FUNCTIONS AS A SOCIAL INSECT.

WHICH OF THESE IS *NOT* A SOCIAL INSECT?

THE BEE THAT CANNOT STING IS THE

THE BEE THAT DOES *NOT* WORK IS THE

SOFTBODIED, HELPLESS WHITE GRUBS THAT CANNOT FEED THEMSELVES ARE

32
WHICH OF THE FOLLOWING IS *NOT* A JOB OF THE WORKER BEES

A. GATHER NECTAR
B. CONSTRUCT THE HONEYCOMB
C. ACT AS A NURSE
*D. LAY EGGS

WHEN THE OLD QUEEN AND HER FOLLOWERS LEAVE THE HIVE TO ESTABLISH A NEW SOCIETY, IT IS CALLED

*A. SWARMING*
B. MIGRATING*
C. POLLINATING
D. SEARCHING

THE MAIN *DIFFERENCE* BETWEEN SOCIAL INSECTS AND PEOPLE IN OUR SOCIETY IS THAT

A. PEOPLE WORK TOGETHER
B. PEOPLE SHARE TASKS
*C. PEOPLE CAN CHOOSE THE WORK THEY WANT TO DO AND CAN CHANGE THEIR MINDS
D. PEOPLE HAVE SOLDIERS TO HELP PROTECT THEM

THE MAIN REASON WHY BEES TRAVEL FROM FLOWER TO FLOWER IS

A. TO CARRY POLLEN
*B. TO GATHER FOOD FOR THEMSELVES
C. TO GET A VARIETY OF NECTAR
D. TO MAKE HONEY FOR PEOPLE

BEES LIVE IN HIVES, ANTS LIVE IN

A. NESTS
*B. COLONIES
C. DENS
D. HIVES

*----------------------------------------------------------------------------------------------------------------*

CHARACTERISTICS OF PLANTS

THE STUDENT WILL COMPREHEND THE TWO FUNCTIONS OF THE PLANT ROOT BY CHOOSING THESE CORRECTLY FROM INCORRECT STATEMENTS ABOUT ROOT FUNCTIONS.

*4a*

CHOOSE THE CORRECT ANSWER.

THE STRUCTURE OF SUPPORT THAT EMERGES FROM A SEED IS THE

A. STEM
B. LEAVES
*C. ROOT
D. FLOWER

THE *PRIMARY* FUNCTION OF THE PLANT ROOT IS TO ...

WATER AND MINERALS NEEDED FOR THE PLANT TO LIVE

A. LEAVE OUT
B. STORE
*C. RELEASE
*D. TAKE IN

AS THE SEEDLINGS GROW, STUDENTS WILL NOTICE IN THE NUMBER
OF ROOT HAIR ON EACH ROOT.
*A. AN INCREASE
*B. A DECREASE
*C. NO CHANGE
*D. NONE OF THESE

THE SUPPORTING SOURCE OF A PLANT IS FORMED BY THE
*A. BUD.
*B. ROOT.
*C. STEM.
*D. LEAVES.

THE STUDENT SHOWS HIS KNOWLEDGE OF THE FIVE TYPES OF TISSUE BY IDENTIFYING FACTS ABOUT THEIR STRUCTURE AND FUNCTION.

CHOOSE THE CORRECT ANSWER.

A SINGLE TYPE OF TISSUE IS COMPRised OF A GROUP OF
*A. CELLS.
*B. MOLECULES.
*C. ORGANS.
*D. SYSTEMS.

EACH TISSUE HAS A TASK.
*A. MULTIPLE
*B. SPECIAL
*C. INDIVIDUAL
*D. GENERAL

THE FIVE TYPES OF TISSUE ARE -
*A. DIGESTIVE, SKELETAL, NERVE, EPITHELIAL, BLOOD
*B. EXCRETORY, BLOOD, NERVE, MUSCLE, DIGESTIVE
*C. BONE, MUSCLE, NERVE, EPITHELIAL, BLOOD
*D. MUSCLE, BONE, NERVE, BLOOD, EXCRETORY

YOUR SKIN IS MADE UP OF WHICH TYPE OF TISSUE?
*A. BLOOD
*B. BONE
*C. MUSCLE
*D. EPITHELIAL

THE STUDENT WILL COMPREHEND THE FOUR PARTS OF A PLANT STEM CAMBUM, XYLEM, PHLOEM AND VASCULAR BUNDLES BY POINTING TO THE CORRECT LOCATION ON THE CROSS SECTION OF A STEM CHART.

CHOOSE THE CORRECT ANSWER.

THE PHLOEM AND XYLEM MAKE UP THE OF THE STEM.
*A. VASCULAR BUNDLE
*B. FIRROUS ROOT
*C. PLANT LFAF
*D. FOOD CONDUCTING TISSUF

THE CAMBUM IS A LAYER OF CELLS THE PHLOEM AND XYLEM.
*A. BENEATH
THE STUDENT WILL DEMONSTRATE A KNOWLEDGE OF CLASSIFICATION OF PLANTS BY SELECTING THE CORRECT CLASSIFICATION FOR GIVEN PLANTS.

CHOOSE THE CORRECT ANSWER.

FERNS, HORSETAILS AND CLUB MOSSES ARE
A. THALLOPHYTES.
B. BRYOPHYTES.
*C. PTERIDOPHYTES.
D. SPERMATOPHYTES.

WHICH OF THESE IS *NOT* A SPERMATOPHYTE0
A. ROSE
B. EVERGREEN
C. CUCUMBER
*D. LICHEN

THE THALLOPHYTES ARE THE SIMPLEST PLANTS. THEY INCLUDE
A. GARDEN FLOWERS.
B. FERNS, HORSETAILS, CLUB MOSSES.
*C. ALGAE AND LICHENS.
D. MOSSES AND LIVERWORTS.

AMONG THE BRYOPHYTES ARE
A. VEGETABLES AND SHRUBS.
B. GARDEN FLOWERS.
*C. MOSSES AND LIVERWORTS.
D. FERNS, HORSETAILS AND CLUB MOSSES.
F. ALGAE, FUNGI AND LICHENS.

THE STUDENT CAN RECALL THE PARTS OF A FLOWER BY SELECTING THE CORRECT PART FROM ITS DESCRIPTION OR LOCATION.

CHOOSE THE CORRECT ANSWER.

ONE OF THE GREEN, LEAFLIKE SECTIONS AROUND THE PETAL IS CALLED
*A. SEPAL.
B. COROLLA.
C. CALYX.
D. ANTER.

ALL OF THE PETALS TOGETHER FORM THE
A. CALYX.
B. STYLE.
*C. COROLLA.
D. STIGMA.

ALL OF THE SEPALS TOGETHER ARE KNOWN AS THE
*A. CALYX.
B. PETALS.
THE STRUCTURE THAT SERVES AS A PROTECTIVE RING AROUND THE FLOWER IS THE
* A. CALYX
B. PETAL
C. COROLLA
D. OVARY
E. STYLE

THE BULB AT THE BOTTOM OF THE FLOWER IS THE
* A. PISTIL
B. OVARY
C. ANTH...
WHEN WE EAT CARROTS OR BEETS WE ARE EATING THE

*OF THE PLANT.*
A. LEAF
B. STEM
C. SEED
*D. ROOT
E. FRUIT

WHICH OF THE FOLLOWING IS *NOT* THE FRUIT OF THE PLANT?
A. ORANGES
B. PEACHES
*C. CORN
D. PUMPKIN

BROCCOLI SPEARS ARE CONSIDERED THE

*OF THE PLANT.*
A. LEAF
*B. STEM
C. SEED
D. ROOT
E. FRUIT

LETTUCE AND CABBAGE ARE CONSIDERED THE

*OF THE PLANTS.*
*A. LEAVES
B. STEMS
C. SEEDS
D. ROOTS
E. FRUITS

C. *------------------------------------------------------------------------------------------*
The student will demonstrate an understanding of the nitrogen cycle by selecting the changes that occur at a particular point in the cycle.

**Using the Nitrogen Cycle, choose the correct response.**

Green plants make their own
- A. Food.
- B. Nitrates.
- C. Water.
- D. Oxygen.

When plants and animals decay, the protein is changed into
- A. Hydrogen.
- B. Nitrogen.
- C. Carbon.
- D. Oxygen.

The soil supplies what agent to change the waste product into a nitrates and other chemicals?
- A. Sunlight
- B. Oxygen
- C. Carbon
- D. Bacteria

In the course of many years, the substance which eventually is used by plants to form proteins, becomes part of a
- A. Sulfate
- B. Sulfide
- C. Nitrate
- D. Oxide

The green plant produces food by the process of
- A. Respiration
- B. Photosynthesis
- C. Transpiration

Nitrates are used by the plant to form
- A. Starches
- B. Sugars
- C. Fats
- D. Proteins

The by-product of photosynthesis in green plants is
- A. Chloroplasts
- B. Sugar changed to carbohydrates *starches*
- C. Minerals
- D. Protein

The waste product produced by animals are changed to
- A. Starches
- B. Sugars
- C. Oxides
- D. Nitrates

**After studying the characteristics of the lower forms of plant and animal cells, the student can apply this information to distinguish whether a given organism is a plant or animal cell.**
CHOOSE THE CORRECT ANSWER.

A CELL CONTAINS CHLOROPHYLL AND MANUFACTURES ITS OWN FOOD. THIS CHARACTERISTIC IS TYPICAL OF THE CELL OF

A. AN ANIMAL.
B. A PLANT.
*C. BOTH.
D. NEITHER.

PROTOPLASM IS FOUND IN A CELL. THIS CELL IS CHARACTERISTIC OF

A. A PLANT.
B. AN ANIMAL.
*C. BOTH.
D. NEITHER.

THE SIZE OF A CELL IS USUALLY UNLIMITED. THIS CHARACTERISTIC IS FOUND IN THE CELL OF

*A. AN ANIMAL.
B. A PLANT.
C. NEITHER.
D. BOTH.

AFTER STUDYING THE CHARACTERISTICS OF BACTERIA AND MOLD, THE STUDENT CAN APPLY THIS INFORMATION TO DISTINGUISH WHETHER A GIVEN MICROORGANISM IS A BACTERIA OR MOLD. 

CHOOSE THE CORRECT ANSWER.

IF THE MICROORGANISM GROWS BEST UNDER MOIST CONDITIONS, IT IS TYPICAL OF

A. MOLD.
B. BACTERIA.
*C. BOTH.
D. NEITHER.

IF A MICROORGANISM REPRODUCES ITSELF BY CELL DIVISION, IT IS TYPICAL OF

A. MOLD.
*B. BACTERIA.
C. BOTH.
D. NEITHER.

A MICROORGANISM BOTH HARMFUL AND HELPFUL TO MAN, IS TYPICAL OF

A. MOLD.
B. BACTERIA.
*C. BOTH.
D. NEITHER.

THE STUDENT WILL KNOW THREE TYPES OF BACTERIA BY SELECTING EACH TYPE FROM A GROUP OF TERMS. 

CHOOSE THE CORRECT ANSWER.
THE TYPE OF BACTERIA IS CALLED
A. MOLD.
B. PENICILLIN.
*C. BACILLI.*

ONE TYPE OF BACTERIA IS
A. SQUARE IN SHAPE.
B. TRIANGULAR IN SHAPE.
*C. RODLIKE IN SHAPE.
D. RECTANGULAR IN SHAPE.

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THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF MONOCOTS AND
DICOTS BY SELECTING THE REASON FOR CLASSIFYING EACH AS SUCH. %6

CHOOSE THE CORRECT ANSWER.

JOHN WAS STUDYING A CORN PLANT AND DECIDED IT WAS A MONOCOT. WHY?
A. IT HAD NET VEINS.
B. THE ROOTS WERE NOT WOODY.
*C. THE VEINS WERE PARALLEL.
D. THE STEM WAS CIRCULAR.

A SEED IS A DICOT IF IT HAS
A. AN OVAL SHAPE.
B. ONE FOOD PART.
C. A HARD COVERING.
*D. TWO FOOD PARTS.

FLOWERS THAT ARE MONOCOTS HAVE
*A. PETALS IN GROUPS OF FOUR OR FIVE.
B. PETALS IN GROUPS OF THREE, SIX OR NINE.
*C. STAMENS IN GROUPS OF TWO OR FOUR.
D. ANThERS THAT ARE YELLOW.

THE TULIP TREE IS A DICOT BECAUSE THE
*A. BUNDLES OF TUBES ARE ARRANGED IN A RING.
B. BUNDLES OF TUBES ARE NOT ARRANGED.
*C. LEAVES ARE PARALLEL VFINEd.
D. FLOWERS HAVE THREE, SIX OR NINE PETALS.

*MONOCOTS AND DICOTS ARE
A. SPORE MAKERS.
B. MOSSES.
*C. SEED MAKERS.
D. FERNS.

SOME EXAMPLES OF DICOTS ARE
A. ROSES, GRASS, AND APPLE TREES.
B. GRASS, CORN, AND WHEAT.
*C. TULIPS, FERNS, LILY.
*D. ROSES, ELM TREES, AND LILACS.

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THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF PLANT
ADAPTATION BY SELECTING THE *MOST* APPROPRIATE REASON WHY THE
GIVEN PLANTS HAVE ADAPTED THEMSELVES. %4


CHOOSE THE CORRECT ANSWER.

SOME PLANTS PRODUCE MANY SEEDS BECAUSE
A. THERE ARE NOT ENOUGH PLANTS.
B. ONE SEED IS PRODUCED FOR EVERY PETAL.
C. ALL PLANTS DIE DURING WINTER.
*D. NOT ALL OF THE SEEDS WILL GROW.

CACTI HAVE THICK WAXY LEAVES BECAUSE
*A. IT HELPS KEEP MOISTURE IN THE PLANT.
B. SEVERAL LEAVES GROW TOGETHER.
C. REES PUT WAX ON THE LEAVES.
D. IT ATTRACTS ANIMALS TO IT.

CACTI HAVE THORNS TO PROTECT THEM BECAUSE
A. ANIMALS LIKE TO LIE IN THEIR SHADE.
B. THORNS HELP BLOCK THE SUN.
*C. ANIMALS TRY TO GET THEIR STORED WATER.
D. ANIMALS WILL CHEW ON THE THORNS INSTEAD OF THE LEAVES.

THE STUDENT WILL SHOW HIS ABILITY TO DRAW CONCLUSIONS ABOUT PHOTOSYNTHESIS BY SELECTING THE CORRECT CONCLUSION.

SELECT THE ANSWER WHICH IS *NOT* CORRECT.

SEED MAKERS
A. ELM TREES
B. PETUNIAS
C. MUSHROOMS
*D. ASTERS

SPORE MAKERS
A. FERNS
B. ALGAE
C. MOSSES
D. MUSHROOMS

MAKES SEEDS FROM FLOWERS
A. ROSES
B. TULIPS
C. MAPLE TREE
*D. PINE TREE

MAKES SEEDS FROM CONES
*A. ELM TREE
B. CEDAR
C. BALSAM FIR
D. SPRUCE

PLANTS THAT DO *NOT* MAKE SEEDS
A. FUNGI
B. MOLD
C. GRASS
*D. ALGAE

PLANTS THAT DO *NOT* MAKE SPORES
*A. MOLD
THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE OF THE FLOWER PARTS BY IDENTIFYING EACH PART IN A DIAGRAM. %7a %NEED DIAGRAM OF FLOWERS

CHOOSE THE CORRECT ANSWER.

THE OVARY IS NUMBER
A. TWO.
B. FIVE.
C. SEVEN.
D. THREE.

THE STAMEN IS NUMBER
A. THREE.
B. FOUR.
C. ONE.
D. TWO.

THE ANther IS NUMBER
A. ONE.
B. TWO.
C. THREE.
D. FOUR.

THE PETALS ARE NUMBER
A. SEVEN.
B. THREE.
C. FIVE.
D. FOUR.

THE PISTIL IS NUMBER
A. ONE.
B. FIVE.
C. THREE.
D. SIX.

THE OvULE IS NUMBER
A. TWO.
B. SIX.
C. FOUR.
D. FIVE.

THE SEPALS ARE NUMBER
A. ONE.
B. THREE.
C. SEVEN.
D. FOUR.
Choose the letter of the item which has the same relationship as the given pair.

Seeds are to tulips as spores are to
A. Yeast.
B. Fern.
C. Monocot.
* D. Sunflower.

Sunflower is to rose as pine tree is to
A. Maple tree.
* B. Lily.
C. Elm tree.
D. Spruce tree.

Dicot is to rose as monocot is to
* A. Grass.
B. Willow tree.
C. Tulip.
D. Daisy.

Grass is to corn as monocot is to
A. Elm tree.
B. Dicot.
* C. Monocot.
D. Mushrooms.

Yeast is to mold as mold is to
A. Daisy.
B. Mosses.
* C. Mushrooms.
D. Fern.

Dicot is to seeds as monocot is to
A. Ferns.
B. Flowers.
C. Spores.
* D. Seeds.

Moss is to robin as fern is to
A. Rose.
* B. Ostrich.
C. Cactus.
D. Moss.

Fungi is to mushroom as mushroom is to
A. Mold.
B. Moss.
C. Fern.
* D. Poison Amanita.

Cocci is to bacteria as mold is to
A. Fern.
B. Algae.
* C. Fungus.
D. Moss.

Flowers are to monocots as cones are to
* A. Conifers.
B. Dicot.
C. Mosses.
THE STUDENT WILL DEMONSTRATE HIS COMPREHENSION OF CELL DIVISION BY MATCHING A SPECIFIED FUNCTION WITH THE STAGE OF MITOSIS IT DESCRIBES.  %5

CHOOSE THE CORRECT ANSWER.

IN ONE CELLED PLANTS, MITOSIS IS MAINLY FOR
A. GROWTH.
* B. REPRODUCTION.
C. HEALING.
D. HEALTH.

HOW MANY STAGES OF MITOSIS ARE THERE?
A. 1
B. 2
C. 3
*D. 4

MITOSIS IS CELL DIVISION FOR
A. GROWTH.
B. REPRODUCTION.
C. HEALING.
*D. ALL THREE.

DURING MITOSIS, THE CHROMOSOMES SPLIT DURING THE STEP CALLED
A. PROPHASE.
B. METAPHASE.
*C. ANAPHASE.
D. TELOPHASE.

IN MULTI-CELLED ORGANISMS, MITOSIS IS *MAINLY* FOR
A. HEALING.
* B. GROWTH.
C. REPRODUCTION.
D. HEALTH.

THE STUDENT WILL ANALYZE THE PROCESS BY WHICH PLANTS MANUFACTURE THEIR OWN FOOD BY IDENTIFYING SUBSTANCES AND CHEMICAL CHANGES THAT MAKE UP THE PROCESS.  %9

CHOOSE THE CORRECT ANSWER.

PLANTS NEED SOIL, WATER AND AIR FOR GROWTH. THE NAME OF THE COLORLESS GAS THE PLANT ABSORBS FROM THE AIR IS
A. OXYGEN.
*B. CARBON DIOXIDE.
C. NITROGEN.

A TREE MAKES ITS OWN FOOD BY
A. COMBINING CARBON DIOXIDE AND WATER TO MAKE SUGARS AND STARCHES.
*B. COMBINING OXYGEN AND WATER TO MAKE FOOD SUBSTANCES.
C. COMBINING NITROGEN AND WATER TO MAKE SUGARS AND STARCHES.
HOW DOES THE PLANT OBTAIN THE MINERALS FROM THE SOIL?

A. THE MINERALS ARE TAKEN IN BY THE ROOTS.
B. THE MINERALS ARE TAKEN FROM THE AIR.
*C. THE MINERALS ARE DISSOLVED IN WATER AND ABSORBED BY THE ROOT HAIRS.

A FARMER PLANTED CORN FOR TWO YEARS IN A ROW. CORN TAKES NITRATES OUT OF THE SOIL. IN ORDER TO REPLACE THE NITRATES, THE FARMER SHOULD

A. REPLANT THE CORN NEXT SPRING, BUT NOT HARVEST IT.
B. LET THE FIELD STAND IDLE, IN THIS WAY NO MORE NITRATES WOULD BE TAKEN.
*C. PLANT A BEAN CROP OR ALFALFA TO REPLACE THE NITRATES.

WHAT NAME IS GIVEN TO SUBSTANCES THAT PUT NITRATES AND PHOSPHATES BACK IN THE SOIL?

*A. FERTILIZERS
B. MINERALS
*C. COMPOUNDS

GREEN PLANTS CAN MANUFACTURE THEIR OWN FOOD UNDER CERTAIN CONDITIONS. IF THEY ABSORB THE DISSOLVED MINERALS FROM THE SOIL AND CARBON DIOXIDE FROM THE AIR, PLANTS STILL NEED

A. COOL TEMPERATURE AND WATER.
*B. HEAT AND SUNLIGHT.
*C. DARKNESS AND HUMIDITY.

HEATING SUGAR SHOWS THAT SUGAR IS A COMBINATION OF CHEMICAL SUBSTANCES. THESE SUBSTANCES ARE

*A. CARBON AND WATER VAPOR.
B. OXYGEN AND WATER VAPOR.
*C. NITROGEN AND WATER VAPOR.

NOW THAT WE KNOW SUGAR IS MADE OF CARBON AND WATER VAPOR, WE CAN SAY SUGAR IS MADE OF

*A. CARBON, OXYGEN, HYDROGEN.
B. CARBON, NITROGEN, AND WATER.
*C. HYDROGEN, OXYGEN AND NITROGEN.

JOHNNY WAS EXPERIMENTING WITH CARBON, OXYGEN, AND HYDROGEN. SOME OF THE SUBSTANCES HE MADE BY COMBINING THESE ELEMENTS WERE

A. SUGAR AND STARCH.
*B. WATER VAPOR, AND CARBON DIOXIDE.
*C. HYDROGEN PEROXIDE.

THE STUDENT WILL ANALYZE AN EXPERIMENT INVOLVING THE USE OF STORED PLANT FOOD BY IDENTIFYING THE CAUSE FOR CONTINUED PLANT GROWTH. %10

CHOOSE THE CORRECT ANSWER.

JANE MEASURED THE THICKEST PART OF AN ONION BULB AND RECORDED IT.

SHE THEN PLACED IT IN A GLASS OF WATER SO THAT THE BOTTOM JUST TOUCHED THE WATER. FINALLY SHE PLACED IT IN A DARK CLOSET.
After a few weeks, she took it out of the closet and found it had grown roots and a stem. She measured the onion again and it was smaller. Which of the following statements best explains her findings.

A. The darkness of the closet caused it to shrink.
B. Some of the food stored in the bulb was used for growth.
C. Not enough information given.

The student will be able to apply his knowledge of plants and fungi by selecting distinguishing characteristics of green plants and fungi.

Choose the correct answer.

One of the main reasons why fungi plants cannot manufacture their own food is that they lack

A. chlorophyll.
B. cytoplasm.
C. protoplasm.

What are some of the sources from which fungi plants can obtain food?

A. soil and rock
B. dead plants and animals
C. atmosphere and water

An example of a fungus plant would be a

A. green plant.
B. bread mold.
C. dead plant.

Yeast is called a fungus because

A. it can make its own food.
B. it has a green color.
C. it cannot make its own food.

The student will analyze different plant environments and select the best environment for a particular plant.

Choose the correct answer.

Sugar beets and violets were placed in sandy soil and in direct sunlight. Both were watered every other day. The violets did not grow very well because the environment

A. was lacking sufficient sunlight for the violets.
B. did not satisfy the needs of the violets.
C. lacked sufficient water for the violets.
BY IDENTIFYING THE MAIN CONDITION THAT CAUSED LACK OF PLANT GROWTH.

CHOOSE THE CORRECT ANSWER.

PLANT A HAS AN UNUSUALLY *LONG* STEM, LIGHT GREEN COLOR, AND *VERY* FEW LEAVES. PLANT A WAS MOST LIKELY GROWN IN

A. A *DARK* PLACE.
B. *DIRECT* SUNLIGHT.
C. *GOOD* SOIL.

AFTER STUDYING THE TYPES OF BACTERIA, THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF THE TYPES OF BACTERIA BY MATCHING CHARACTERISTICS OF MICROBES WITH THE PROPER KIND OF BACTERIA.

CHOOSE THE CORRECT ANSWER.

WHAT TYPE OF BACTERIA WOULD BE GROWING ON A PIECE OF CLOVER?
A. SPIRILLA.
B. BACILLI.
C. COCCI.
D. NOT ENOUGH INFORMATION GIVEN.

WHAT TYPE OF BACTERIA ARE SPHERICAL LIKE TINY MARBLES UNDER A MICROSCOPE?
A. SPIRILLA.
B. BACILLI.
C. COCCI.
D. ALL OF THE ABOVE.

WHAT TYPE OF BACTERIA ARE SHAPED LIKE LITTLE RODS?
A. BACILLI.
B. SPIRILLA.
C. COCCI.
D. ALL OF THE ABOVE.

THE STUDENT WILL DEMONSTRATE A KNOWLEDGE OF MOLECULES BY SELECTING THE PROPERTIES OF THEM FROM A SERIES OF QUESTIONS.

CHOOSE THE CORRECT ANSWER.

WHICH OF THE FOLLOWING IS *ALWAYS* TRUE OF MOLECULES?
A. THEY NEVER STOP MOVING.
B. THEY MOVE IN ONLY ONE DIRECTION.
C. THEY ALWAYS MOVE VERY SLOWLY.
D. THEY ALWAYS MOVE AT THE SAME RATE.

MOLECULES ARE MADE UP OF
A. MODELS.
B. MOTION.
HEAT ENERGY IS PRODUCED WHEN MOLECULES
A. STOP
*B. MOVE FASTER
C. MOVE SLOWER
D. SPREAD OUT

WHEN HEAT ENERGY IS APPLIED TO MOLECULES THEY
*A. MOVE FASTER
B. EXPAND
C. CONTRACT
D. DISAPPEAR

WHEN MOLECULES ARE COOLED THEY
A. STOP MOVING
B. MOVE FASTER
*C. MOVE MORE SLOWLY
D. SHRINK

*************************************************************
THE STUDENT WILL DEMONSTRATE A KNOWLEDGE OF MATTER BY SELECTING
THE CHARACTERISTICS FROM A SERIES OF QUESTIONS. %50

CHOOSE THE CORRECT ANSWER.

WHICH OF THE FOLLOWING IS *NOT* A CHARACTERISTIC OF MATTER?
*A. ITS STATE ALWAYS REMAINS THE SAME
B. IT IS MADE UP OF MOLECULES AND ATOMS
C. IT TAKES UP SPACE
D. IT HAS WEIGHT

WHICH OF THE FOLLOWING IS *NOT* A STATE OF MATTER?
A. GAS
B. LIQUID
*C. ATOM
D. SOLID

MOLECULES VIBRATE IN A FIXED POSITION IN
A. A GAS
B. A LIQUID
C. AN ATOM
*D. A SOLID

IN WHICH STATE OF MATTER ARE THE MOLECULES FARTHEST APART?
*A. GAS
B. LIQUID
C. ATOM
D. SOLID

IN .......... THE MOLECULES ARE FREE TO MOVE OVER AND AROUND EACH
OTHER
A. A CRYSTAL
*B. A LIQUID
C. AN ATOM
D. A SOLID
THE STUDENT CAN DISTINGUISH BETWEEN AN ELEMENT AND A COMPOUND BY SELECTING EXAMPLES AND DEFINITIONS FOR EACH. %49

CHOOSE THE CORRECT ANSWER.

A SUBSTANCE COMPOSED OF ONLY ONE KIND OF ATOM IS
A. A MIXTURE.
B. AN ELEMENT.
*R. A COMPOUND.
C. A SOLUTION.

WHICH OF THE FOLLOWING IS NOT A COMPOUND
A. SOAP
B. STARCH
C. SALT
*D. SILVER
E. ALCOHOL

THE SMALLEST PART OF SUGAR IS A SUGAR
A. ATOM.
B. ELEMENT.
*C. MOLECULE.
D. SOLUTION.

WHICH OF THE FOLLOWING SENTENCES IS *NOT* ABOUT A COMPOUND
A. IRON AND OXYGEN FORM IRON OXIDE.
B. THE CHEMICAL SYMBOL FOR WATER IS H O.
*C. SUGAR MOLECULES ARE MADE UP OF CARBON, HYDROGEN AND OXYGEN ATOMS.
*D. THE CHEMICAL SYMBOL FOR OXYGEN IS O.

THE CHILD CAN DISTINGUISH BETWEEN A PHYSICAL CHANGE AND A CHEMICAL CHANGE BY SELECTING EXAMPLES FOR EACH. %31

CHOOSE THE CORRECT ANSWER.

WHICH OF THE FOLLOWING IS A CHEMICAL CHANGE
A. MELTING
B. FREEZING
*C. BURNING
D. EVAPORATING

WHICH OF THE FOLLOWING SENTENCES DESCRIBES A PHYSICAL CHANGE
A. GASOLINE BURNS IN A MOTOR.
B. SALT DISSOLVES IN WATER.
C. A CANDLE BURNS.
*D. IRON RUSTS.

A CHANGE IN A COMPOUND IS PHYSICAL IF
A. THE MOLECULES OF A SUBSTANCE CHANGE.
*R. THE MOLECULES OF A SUBSTANCE DO NOT CHANGE.
C. THE ATOMS ARE ARRANGED DIFFERENTLY.
D. SOME OF THE MOLECULES ARE LOST.
THE STUDENT WILL KNOW THE MEANING OF MIXTURE, ELEMENT, AND COMPOUND BY SELECTING THE CORRECT DEFINITION FOR EACH TERM.

CHOOSE THE CORRECT ANSWER.

MIXTURE IS DEFINED AS

A. TWO OR MORE ELEMENTS THAT COMBINE.
B. THREE OR MORE SUBSTANCES THAT ARE CHEMICALLY BONDED.
*C. TWO OR MORE SUBSTANCES COMBINED BUT NOT CHEMICALLY BONDED.

COMPOUND IS DEFINED AS

A. TWO OR MORE SUBSTANCES THAT ARE PHYSICALLY UNITED.
B. A NEW SUBSTANCE DIFFERENT FROM THE SUBSTANCES FROM WHICH IT WAS ORIGINALLY MADE.
*C. A SUBSTANCE THAT IS MADE UP OF ONLY ONE GENERAL TYPE OF ATOM.

GIVEN A STATE OF MATTER, THE STUDENT CAN COMPREHEND THE DIFFERENCE BETWEEN SOLID, LIQUID, AND GAS BY SELECTING WHICH FORM OF MATTER IS BEING DESCRIBED.

CHOOSE THE CORRECT ANSWER.

WHEN WATER IS FROZEN IN A BOX, THIS NEW STATE OF MATTER IS A

A. GAS.
B. LIQUID.
*C. SOLID.

WHEN WATER IS CONVERTED TO STEAM VAPOR, THIS NEW STATE OF MATTER IS A

*A. GAS.
B. LIQUID.
C. SOLID.

WHEN HEATING AN ICECUBE, A NEW STATE OF MATTER IS FORMED. THIS NEW STATE OF MATTER IS A

A. GAS.
*B. LIQUID.
C. SOLID.

GIVEN A LIST OF DEFINITIONS, THE STUDENT WILL SHOW THAT HE CAN RECALL THE STATES OF MATTER BY MATCHING THE STATE WITH ITS CORRECT DEFINITION.

MATCH THE WORD WITH THE CORRECT DEFINITION.

A. SOLID
B. LIQUID
*C. GAS

TAKES THE SHAPE OF ITS CONTAINER BUT CANNOT EXPAND FREELY TO FILL IT
TAKES THE SHAPE OF ITS CONTAINER AND EXPAND FREELY TO FILL IT

GIVEN A LIST OF OBJECTS, THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF THE THREE STATES OF MATTER BY IDENTIFYING EXAMPLES OF EACH STATE FROM A LIST.

CHOOSE THE CORRECT ANSWER.

AN EXAMPLE OF A SOLID IS
A. OXYGEN.
*B. METAL.
C. ROOT BEER.
D. COFFEE.

AN EXAMPLE OF A SOLID IS
A. WATER.
B. MILK.
C. HELIUM.
D. TIN.

OF THE FOLLOWING EXAMPLES, ONLY IS A SOLID.
*A. GOLD.
B. OXYGEN.
C. CARBON-DIOXIDE.
D. INK.

OF THE FOLLOWING EXAMPLES, ONLY IS A LIQUID.
A. COPPER
*B. ZINC
C. LIME JUICE
D. HELIUM

ONE EXAMPLE OF A LIQUID IS
*A. WATER.
B. IRON
C. FREON.
D. SILVER.

OF THE FOLLOWING EXAMPLES, ONLY IS A GAS.
A. TEA
B. SOUP
C. COAL
D. OXYGEN

OF THE FOLLOWING EXAMPLES, ONLY IS A GAS.
A. COPPER
B. HELIUM
C. ZINC
D. WATER

OF THE FOLLOWING EXAMPLES, ONLY IS A LIQUID.
A. TIN FOIL
*B. ORANGE JUICE
C. ALUMINUM FOIL
D. CARBON-MONOXIDE
AN EXAMPLE OF A GAS IS
A. NEON
B. ICE
C. GRANITE
D. LAVA

AN EXAMPLE OF A SOLID IS
A. GRAPE JUICE
B. CREAM
C. HELIUM
D. LIMESTONE

THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF THE
DEFINITIONS OF THE THREE STATES OF MATTER BY APPLYING THE
DEFINITIONS TO NEW SITUATIONS.

CHOOSE THE CORRECT ANSWER.

BILL WAS GIVEN A CLOSED JAR OF HELIUM, A GLASS OF WATER AND A
BRICK AND TOLD TO USE ONE OF THESE REPRESENTATIVES OF EACH
STATE OF MATTER TO GET A BOOK JUST BEYOND HIS REACH. HE
WOULD USE TO GET THE BOOK.
A. THE HELIUM
B. THE BRICK
C. THE WATER

MARY WAS GIVEN A CUP OF MILK, A BALLOON FILLED WITH HYDROGEN,
AND A BAR OF ALUMINUM AND TOLD TO USE ONE OF THESE REPRESENTATIVES OF EACH OF THE THREE STATES OF MATTER TO SUPPORT THE CORNER OF A COFFEE TABLE WHICH WAS MISSING A LEG. SHE WOULD USE TO SUPPORT THE CORNER.
A. THE MILK
B. THE HYDROGEN
C. THE ALUMINUM

JOHN WAS GIVEN A PINT OF WATER, A PINT OF HELIUM, AND A PINT OF
TALCUM POWDER AND TOLD TO COMPLETELY FILL A GALLON CONTAINER
WITH ONE OF THE THREE REPRESENTATIVES OF THE STATES OF MATTER.
JOHN WOULD USE THE TO COMPLETELY FILL THE GALLON CONTAINER.
A. HELIUM
B. WATER
C. TALCUM POWDER

GEORGE WAS GIVEN A BAR OF LEAD, A QUART OF OIL AND A QUART JAR
OF OXYGEN AND TOLD TO USE ONE OF THE REPRESENTATIVES OF THE THREE STATES OF MATTER TO FILL THE BOTTOM ONE-FOURTH OF A GALLON CONTAINER. GEORGE USED TO FILL THE BOTTOM ONE-FOURTH OF THE GALLON CONTAINER.
A. THE OIL
B. THE LEAD
C. THE OXYGEN

JANE WAS ASKED TO COMPLETELY FILL HER CLASSROOM WITH ONE OF THE FOLLOWING REPRESENTATIVES OF THE THREE STATES OF MATTER. SHE WAS GIVEN A GALLON OF COFFEE, AND ONE QUART OF CHLORINE GAS, AND FIVE POUNDS OF SALT. JANE USED TO COMPLETELY FILL HER
ANN WAS ASKED TO KEEP A FISH TANK OFF THE TABLE BY USING ONE OF THE REPRESENTATIVES OF THE THREE STATES OF MATTER GIVEN TO HER. SHE WAS GIVEN A BLOCK OF WOOD, A JAR OF MUSTARD, AND A JAR OF OXYGEN AND WAS TOLD NOT TO USE THE CONTAINERS THEY WERE IN.

ANN USED THE OXYGEN TO KEEP THE FISH TANK OFF THE TABLE.

JAMES WAS GIVEN A PINT OF MOLTEN COPPER THAT HAD HARDENED INTO A BALL, A PINT OF TEA, AND A PINT OF HYDROGEN, AND ASKED TO FILL THE BOTTOM OF A SQUARE, GALLON CONTAINER SO THAT THE BOTTOM IS COMPLETELY COVERED. JAMES USED THE COPPER TO FILL THE BOTTOM OF THE CONTAINER SO THAT THE BOTTOM WAS COMPLETELY COVERED.

DANIEL WAS ASKED TO COMPLETELY FILL A 50 GALLON BARREL WITH ONE OF THE THREE STATES OF MATTER. HE WAS GIVEN A GALLON JAR OF HELIUM, A GALLON JAR OF MILK, AND A PIECE OF ZINC EQUAL TO ONE GALLON. DANIEL USED THE HELIUM TO COMPLETELY FILL THE 50 GALLON BARREL.

BARBARA WAS GIVEN AN EMPTY 10 GALLON JAR AND ASKED TO FILL THE BOTTOM HALF USING ONE OF THE THREE STATES OF MATTER. THE THREE REPRESENTATIVE SAMPLES OF MATTER GIVEN TO HER WERE 5 GALLONS OF CARBON-DIOXIDE, A BALL OF LEAD EQUAL TO 5 GALLONS WHEN MELTED, AND 5 GALLONS OF INK. BARBARA USED THE LEAD TO FILL THE BOTTOM HALF OF THE 10 GALLON JAR.

JILL WAS GIVEN A BAR OF IRON, A PINT OF ORANGE JUICE, AND A GALLON OF OXYGEN AND WAS ASKED TO USE ONE OF THESE REPRESENTATIVES OF EACH OF THE THREE STATES OF MATTER TO KEEP A WINDOW UP. SHE WAS INSTRUCTED NOT TO USE THE CONTAINERS IN WHICH THE MATTER WAS KEPT. JILL USED THE IRON TO KEEP THE WINDOW UP.

CHOOSE THE CORRECT ANSWER.
AFTER SCREAMING THAT IT HAD SPLASHED ALL OVER THE FLOOR, MARY RAN OUT OF THE ROOM. THE STATE OF MATTER BEING DISCUSSED IS A
A. LIQUID.
B. GAS.
C. SOLID.

AFTER BREAKING THROUGH THE PLATE GLASS WINDOW IT HIT THE METAL WASTEBASKET AND LEFT A DENT IN IT, EXCLAIMED GEORGE. THE STATE OF MATTER BEING DISCUSSED IS A
A. SOLID.
B. GAS.
C. LIQUID.

THE CONTENTS OF THE JAR QUICKLY FILLED THE ENTIRE ROOM AFTER THE TOP WAS REMOVED BY NANCY. THE STATE OF MATTER BEING DISCUSSED IS A
A. LIQUID.
B. SOLID.
C. GAS.

JIM GRABBED THE GLASS CONTAINER AND THREW IT AS HARD AS HE COULD INTO THE EMPTY OIL DRUM AND SLAMMED THE CLEAR PLASTIC LID ON THE DRUM. THE OIL DRUM WAS COMPLETELY FILLED IMMEDIATELY. THE STATE OF MATTER BEING DISCUSSED IS A
A. SOLID.
B. GAS.
C. LIQUID.

THE CONTAINER STRUCK THE GROUND AND THE LID FELL OFF. AFTER THE LID FELL OFF, THE CONTENTS SLOWLY SPREAD ACROSS THE FLOOR. THE STATE OF MATTER BEING DISCUSSED IS A
A. LIQUID.
B. SOLID.
C. GAS.

JOHN THREW THE CONTAINER AGAINST THE WALL AND LAUGHED AS THE CONTENTS RAN DOWN THE WALL AND ONTO THE FLOOR. THE STATE OF MATTER BEING DISCUSSED IS A
A. GAS.
B. SOLID.
C. LIQUID.

BETTY CAUTIOUSLY LIFTED THE TOP OF THE CONTAINER AND ALMOST IMMEDIATELY THE ENTIRE LUNCHROOM WAS FILLED WITH A HORRIBLE STINK. THE STATE OF MATTER BEING DISCUSSED IS A
A. SOLID.
B. GAS.
C. LIQUID.

ADRIENNE CONTINUED TELLING ABOUT HER FAMILY VACATION BY SAYING, AS WE WERE DRIVING THROUGH THE MOUNTAINS, IT ROLLED DOWN THE SIDE AND CRASHED INTO THE SIDE OF OUR CAR, LEAVING A HUGE DENT IN THE DOOR. THE STATE OF MATTER BEING DISCUSSED IS A
A. LIQUID.
AS USUAL, DAVID AND HIS SISTER NANCY WERE GOOFING OFF AT THE PICNIC. NANCY GRABBED THE CONTAINER, PUT HER THUMB OVER THE OPENING, SHOOK IT, AND POINTED THE CONTAINER AT HER BROTHER. JUST AS DAVID JUMPED BEHIND HIS FATHER, NANCY TOOK HER THUMB OFF THE OPENING AND THE CONTENTS SQUIRRELED ALL OVER HER FATHER. THE STATE OF MATTER BEING DISCUSSED IS A

A. LIQUID
B. GAS
C. SOLID

*SUSAN WALKED INTO THE DYNAMITE STORAGE ROOM AND TO HER HORROR SAW THAT THE CEILING WAS BURNING FIERCELY. IN THE CENTER OF THE ROOM WAS A CRATE FILLED WITH ONE HUNDRED STICKS OF DYNAMITE. AS SHE TURNED TO RUN FROM THE ROOM, THE DOOR WAS SLAMMED SHUT BY THE WIND. FRANTICALLY, SHE LOOKED AROUND THE ROOM AND DISCOVERED THREE LARGE CONTAINERS. SUSAN DASHED OVER AND QUICKLY READ THE LABEL ON EACH CONTAINER. THE FIRST ONE WAS A ONE HUNDRED GALLON CONTAINER FILLED WITH WATER. THE SECOND CONTAINER WAS FILLED WITH ONE HUNDRED POUNDS OF BAKING SODA WHICH COULD BE USED TO PUT OUT FIRES. THE THIRD ONE HUNDRED GALLON CONTAINER WAS FILLED WITH AN INERT GAS THAT ALSO COULD PUT OUT FIRES. SHE HAD ONLY ENOUGH TIME TO OPEN ONE CONTAINER BEFORE THE BURNING CEILING WOULD COLLAPSE ON THE CRATE OF DYNAMITE. SHE TORE THE TOP FROM ONE CONTAINER AND FIVE SECONDS LATER THE FIRE WAS COMPLETELY OUT. THE STATE OF MATTER SUSAN USED WAS

A. THE INERT GAS
B. THE WATER
C. THE BAKING SODA.

THE STUDENT WILL RECALL THE PROPERTIES OF MATTER BY IDENTIFYING A PROPERTY WHEN GIVEN A LIST OF ALTERNATIVES. OF THE FOLLOWING ITEMS, ONLY IS A PROPERTY OF *ALL*

MATTER.

A. TAKES UP SPACE
B. HAS COLOR
C. SMELLS BAD
D. IS HARD

OF THE FOLLOWING ITEMS ONLY IS A PROPERTY OF *ALL* MATTER.

A. BOUNCES
B. CAN BE SEEN
C. HAS WEIGHT
D. IS *ET

JIM READ THE LIST OF ITEMS AND SAW THAT ONLY IS A PROPERTY OF *ALL* MATTER.
ANN READ THE FOLLOWING LIST AND SAW THAT ONLY WAS A PROPERTY OF *ALL* MATTER.
* A. MADE UP OF TINY PARTICLES
   B. HAS FOUR CORNERS
   C. MADE UP OF WATER
   D. KEEPS ITS OWN SHAPE

OF THE FOLLOWING ITEMS, ONLY IS A PROPERTY OF *ALL* MATTER.
 A. TAKES A LONG TIME TO MOVE
   B. TAKES UP SPACE
   C. HAS TWO ENDS
   D. USES OXYGEN

OF THE FOLLOWING ITEMS, ONLY IS A PROPERTY OF *ALL* MATTER.
* A. HAS WEIGHT
   B. HAS TWO FEET
   C. IS LONG
   D. HAS HAIR

OF THE FOLLOWING ITEMS, ONLY IS A PROPERTY OF *ALL* MATTER.
 A. MADE OF WOOD
   B. IS SLIPpery
   C. MADE OF BRICKS
   D. MADE UP OF TINY PARTICLES

JOYCE SAW THAT ON THE FOLLOWING LIST ONLY WAS A PROPERTY OF *ALL* MATTER.
 A. MADE UP OF SMALL MARBLES
   B. MADE UP OF TINY BRICKS
   * C. MADE UP OF TINY PARTICLES
   D. MADE UP OF TINY PINS

JEAN SAW THAT ON THE LIST GIVEN TO HER, ONLY WAS A PROPERTY OF *ALL* MATTER.
 A. HAS EYES
   * B. HAS WEIGHT
   C. HAS CLAWS
   D. HAS SMOOTH EDGES

ANDREA SAW THAT ON THE FOLLOWING LIST ONLY WAS A PROPERTY OF *ALL* MATTER.
 A. TAKES UP A COUNTRY
   B. TAKES UP A ROOM
   C. TAKES UP A BUILDING
   D. TAKES UP SPACE

GIVEN A LIST OF STATEMENTS, THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF THE PROPERTIES OF MATTER BY IDENTIFYING THE STATEMENT WHICH APPLIES TO *ALL* MATTER.  □□

CHOOSE THE CORRECT ANSWER.
Given a list of situations involving three conditions of molecular activity, the student will show his understanding of molecular activity by selecting the correct condition.  

Select one of the three conditions for the following situations.

A. Molecular activity has stayed the same.
B. Molecular activity has increased.
C. Molecular activity has decreased.

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A. Jill said the pit smelled.
B. Andrew exclaimed that moss is green.
C. Jim said that hydrogen has weight.
D. John said that iron is hard.

Hank said that statement applies to *all* matter.

A. Iron is made up of tiny particles.
B. Steel is shiny.
C. Butter is soft.
D. Sugar is sweet.

The statement applies to *all* matter.

A. Water is wet.
B. Milk is white.
C. Syrup is sweet.
D. Water takes up space.

Why does the statement apply to *all* matter, asked the teacher.

A. Wood burns.
B. Turpentine is made up of tiny particles.
C. Cream is wet.
D. Rocks are hard.

The statement applies to *all* matter.

A. A brick is heavy.
B. A brick takes up space.
C. Some bricks are red.
D. Bricks keep their own shape.

The statement applies to *all* matter.

A. Helium has a bad smell.
B. Helium is colorless.
C. Helium is made up of tiny particles.
D. Helium has no taste.

The statement applies to *all* gases.

A. The oxygen could not be seen.
B. The oxygen had no smell.
C. The oxygen took up all the space.
D. The oxygen helped in burning the wood.

The statement applies to *all* matter.

A. Hydrogen is made up of tiny particles.
B. Hydrogen has a bad smell.
C. Hydrogen is not hard.
D. Hydrogen can't be seen.

*************
C. MOLECULAR ACTIVITY HAS DECREASED.

1. STEEL PIPE HAS BEEN HIT WITH A HAMMER FOR 20 MINUTES. *B

2. A BALLOON EXPANDS AFTER SITTING IN THE SUN. *B

3. A TRAY OF WATER FREEZES. *C

4. A TABLE IS MOVED FROM THE FRONT OF THE ROOM TO THE BACK. *A

5. A FINGER RING BECOMES TIGHTER IN THE WINTER. *C

6. TELEPHONE WIRES SAG IN THE SUMMER. *B

7. RUBBING YOUR HANDS TOGETHER TO GET THEM WARM. *B

8. THE GAP IN A RAILROAD EXPANSION JOINT WIDENS. *C

9. A SIDEWALK BUCKLES IN THE SUMMER. *B

10. THE MERCURY IN A THERMOMETER DROPS. *C

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GIVEN THE CHARACTERISTICS OF THE THREE STATES OF MATTER, THE STUDENT WILL DISTINGUISH BETWEEN KNOWN MATTER BY CORRECTLY IDENTIFYING ITS NATURAL STATE.

DIRECTIONS - READ THE FOLLOWING PARAGRAPH, THEN PICK THE CORRECT STATE OF EACH MATTER. INDICATE YOUR ANSWER BY THE FOLLOWING KEY.

A. SOLID
B. LIQUID
C. GASEOUS

THERE ARE THREE STATES OF MATTER, SOLID, LIQUID, AND GASES. A SOLID IS DEFINED AS MATTER THAT RETAINS ITS OWN SHAPE. LIQUID TAKES ON THE SHAPE OF ITS CONTAINER. A GAS ALSO TAKES ON THE SHAPE OF ITS CONTAINER, BUT THE MOLECULES SPREAD OUT AND FILL UP THE WHOLE CONTAINER.

ICE *A

OXYGEN *C

MERCURY *B

STEAM *C

WATER *B

CLAY *A

SNOW *A

GLASS *A

LITHIUM *C

GASOLINE *B
THE STUDENT WILL APPLY HIS UNDERSTANDING OF THE EXPANSION OF CHARACTERISTICS OF STATES OF MATTER BY IDENTIFYING THE STATE IN GIVEN EXPERIMENTS.

A BRASS BALL ONE INCH ACROSS WILL PASS THROUGH A RING WHICH IS A LITTLE MORE THAN ONE INCH ACROSS. THE BALL IS HELD OVER A FLAME, UNTIL VERY HOT.

IF THE BALL IS PUT THROUGH THE RING AGAIN IT WILL PROBABLY

A. GO THROUGH THE RING.
B. NOT FIT THROUGH THE RING.
C. GO THROUGH MORE EASILY THAN BEFORE IT WAS HEATED.

THE FLAME CAUSED THE MOLECULES OF THE BRASS BALL TO

A. MOVE CLOSER TOGETHER.
B. TO DECREASE IN MOVEMENT.
C. MOVE FURTHER APART.
D. GET LARGER.

THE EXPERIMENT PROVED ALL OF THE FOLLOWING *EXCEPT*

A. SOLIDS EXPAND WHEN HEATED.
B. BRASS MOLECULES MOVE FURTHER APART WHEN HEATED.
C. SOLIDS BUT NOT LIQUIDS EXPAND WHEN HEATED.
D. MOLECULAR ACTIVITY IS INCREASED BY HEAT.

FROM THE DIAGRAM ONE CAN ASSUME THAT

A. THE LIQUIDS MOLECULAR MOVEMENT DECREASED.
B. THE LIQUIDS ALL EXPANDED.
C. THE MOLECULAR MOVEMENT INCREASED BUT THE TEMPERATURE DECREASED.

THE EXPERIMENT PROVED EVERYTHING *EXCEPT*

A. LIQUIDS EXPAND IN DIFFERENT AMOUNTS.
B. MOLECULAR MOVEMENT INCREASED AS HEAT WAS APPLIED.
C. ALCOHOL EXPANDS MORE THAN MERCURY.
D. ALCOHOL HAS THE GREATEST AMOUNT OF EXPANSION OF *ANY* GIVEN LIQUID.

THE BALLOON IS FILLED WITH A

A. LIQUID.
B. GAS.
C. SOLID.

ELASTICITY, DUE TO THE GREAT MOVEMENT OF MOLECULES, IS A CHARACTERISTIC OF WHICH STATE OF MATTER?

A. SOLID
B. LIQUID
C. GAS
THE SIAIL OF MATTER THAT HAS A GREATER DENSITY OF MOLECULES IS WHICH ONE?
A. SOLID  
B. LIQUID 
C. GAS

THE STATE OF MATTER THAT TAKES THE SHAPE OF ITS CONTAINER IS WHICH ONE?
A. SOLID  
B. LIQUID 
C. GAS

GIVEN INFORMATION ABOUT MATTER OF DIFFERENT DENSITIES, THE STUDENT WILL ANALYZE AND SELECT A CORRECT INFECTION FROM IT.

WHAT INFESSION CAN BE MADE FROM THE FOLLOWING STATEMENTS?
%An COLD AIR IS MORE DENSE THAN WARM AIR.
%B. MATTER OF GREATER DENSITY WILL TEND TO DISPLACE MATTER OF LESSER DENSITY.
A. WARM AIR WILL MOVE COLD AIR  
B. COLD AIR WILL MOVE WARM AIR 
C. COLD AIR AND WARM AIR HAVE NO EFFECT UPON THE OTHER

THE STUDENT CAN IDENTIFY THE COMPOSITION OF SUBSTANCES BY SELECTING WORD EQUATIONS WHICH DESCRIBE THE DECOMPOSITION OR SYNTHESIS OF SUBSTANCES.

WHICH OF THE FOLLOWING WORD EQUATIONS DESCRIBES THE DECOMPOSITION* OF MERCURIC OXIDE?
A. MERCURIC OXIDE ———> MERCURY & OXYGEN  
B. MERCURY & OXYGEN ———> MERCURIC OXIDE  
C. MERCURY ———> MERCURIC OXIDE & OXYGEN

WHICH WORD EQUATION DESCRIBES THE SYNTHESIS* OF IRON OXIDE?
A. IRON & OXYGEN ———> IRON OXIDE  
B. IRON & OXYGEN & CARBON ———> IRON OXIDE  
C. IRON OXIDE ———> IRON & OXYGEN

WHICH WORD EQUATION DESCRIBES THE DECOMPOSITION* OF WATER?
A. WATER ———> CARBON & HYDROGEN & OXYGEN  
B. WATER ———> HYDROGEN & OXYGEN  
C. HYDROGEN & OXYGEN & CARBON ———> WATER

WHICH WORD EQUATION DESCRIBES THE FORMATION OF CALCIUM CARBONATED?
A. CALCIUM HYDROXIDE & WATER ———> CALCIUM CARBONATE & CARBON DIOXIDE  
B. CALCIUM CARBONATE & WATER ———> CALCIUM HYDROXIDE & CARBON DIOXIDE  
C. CALCIUM HYDROXIDE & CARBON DIOXIDE ———> CALCIUM CARBONATE & WATER
WHICH WORD EQUATION DESCRIBES THE TEST FOR TABLE SALTO

A. 
 SILVER CHLORIDE & SODIUM NITRATE → SODIUM CHLORIDE & SILVER NITRATE

*B. 
 SODIUM CHLORIDE & SILVER NITRATE → SILVER CHLORIDE & SODIUM NITRATE

C. 
 SODIUM CHLORIDE & SILVER NITRATE → SODIUM NITRATE & SILVER CHLORIDE

COLOR

THE STUDENT CAN DEMONSTRATE KNOWLEDGE OF THE SPECTRUM BY RECALLING INFORMATION RELATING TO WAVES PER INCH OF COLOR AND VISIBILITY. %50

CHOOSE THE CORRECT ANSWER.

THE HIGHEST FREQUENCY LIGHT WAVE ON THE VISIBLE SPECTRUM IS

A. BLUE.
B. YELLOW.
C. RED.
*D. VIOLET.

WHICH OF THE FOLLOWING IS *NOT* SEEN BY THE NAKED EYE WHEN WHITE LIGHT PASSES THROUGH A PRISMO

A. INFRARED
B. YELLOW
C. ORANGE
*D. GREEN

THE RETINA OF THE EYE RECEIVES AND INTERPRETS COLOR. WHICH OF THE FOLLOWING CANNOT BE SEEN WHEN SUNLIGHT IS PASSED THROUGH A PRISMO

A. RED
*B. ULTRAVIOLET LIGHT
C. ORANGE
D. YELLOW

THE STUDENT CAN SHOW HIS UNDERSTANDING OF THE DOPPLER EFFECT BY IDENTIFYING CHANGES IN COLOR AND/OR WAVE LENGTH OF LIGHT AS STARS MOVE IN THE GALAXY. %30

CHOOSE THE CORRECT ANSWER.

AS A STAR MOVES TOWARD THE EARTH A COLOR CHANGE SEEMS TO OCCUR BECAUSE

A. THE STAR BECOMES COOLER.
B. THE STAR BECOMES HOTTER.
C. PARTICLES IN THE AIR REFLECT THE LIGHT.
*D. LIGHT WAVES ARE CROWDED TOGETHER.
WHEN LIGHT WAVES ARE CROWDED TOGETHER AS A STAR MOVES TOWARD THE EARTH WE COULD EXPECT
A. THE SURFACE TEMPERATURE OF THE STAR TO INCREASE.
B. THE SURFACE TEMPERATURE OF THE STAR TO DECREASE.
C. THE WAVE LENGTH OF LIGHT TO DECREASE.
D. THE FREQUENCY OF LIGHT WAVES TO BECOME LOWER.

WHAT IS THE EFFECT OF A STAR MOVING AWAY FROM EARTH AS DETERMINED BY A SPECTROSCOPE?
A. THE FREQUENCY OF LIGHT BECOMES HIGHER
B. THERE IS A COLOR SHIFT TO THE VIOLET END OF THE SPECTRUM
C. THERE IS NO NOTICABLE EFFECT
D. THE FREQUENCY OF LIGHT BECOMES LOWER WITH A SHIFT TO RED

EARTH SCIENCE

THE STUDENT WILL DEMONSTRATE KNOWLEDGE OF THE GEOLOGICAL CLASSIFICATIONS OF ROCKS BY IDENTIFYING THE CATEGORY OF SEVERAL COMMON ROCKS.

CHOOSE THE CORRECT CATEGORY IN WHICH EACH ROCK WOULD BE CLASSIFIED.
A. IGNEOUS
B. SEDIMENTARY
C. METAMORPHIC

BLACK MARBLE BELONGS TO WHAT GEOLOGICAL GROUPO  *C
PUMICE BELONGS TO WHAT GEOLOGICAL GROUPO  *A
SANDSTONE BELONGS TO WHAT GEOLOGICAL GROUPO  *B
LIMESTONE BELONGS TO WHAT GEOLOGICAL GROUPO  *B
BASALT BELONGS TO WHAT GEOLOGICAL GROUPO  *A
SHALE BELONGS TO WHAT GEOLOGICAL GROUPO  *B
QUARTZ BELONGS TO WHAT GEOLOGICAL GROUPO  *C
LAVA BELONGS TO WHAT GEOLOGICAL GROUPO  *A
COAL BELongs TO WHAT GEOLOGICAL GROUPO  *B


CHOOSE THE CORRECT ANSWER.
MINERAL PRODUCTS CAN BE FOUND
A. %AA
2400477
THE FORMATIONS WHICH SHOW SIGNS OF WIND AND SOIL EROSION ARE FORMED ON
A. THE FLOOR OF THE OCEAN.
*B. THE SURFACE OF THE LAND.
C. BOTH OF THE ABOVE.

IF WE DESCRIBED A SURFACE'S CONDITION AS HAVING BASINS, TRENCHES, AND SLOPES, WE WOULD BE DESCRIBING
A. THE FLOOR OF THE OCEAN.
B. THE SURFACE OF THE LAND.
*C. BOTH OF THE ABOVE.

Given information on oceanography the student will apply his understanding of erosion by selecting the logical explanation for given phenomenon.

Read the following statement. Then choose the logical explanation for this occurrence from the following list.

THE OCEAN FLOOR IS VERY SIMILAR TO THE SURFACE OF THE LAND; ONLY THE OCEAN FLOOR IS COVERED WITH WATER. CONTRARY TO THIS SIMILARITY, EROSION HAS ALTERED LAND FEATURES TO A GREATER DEGREE THAN THE OCEAN FLOOR.

THE REASONS FOR THIS BEING JUSTIFIED ARE
A. THE EROSION FORCES OF WIND AND SUN ARE WASHED AWAY ON THE FLOOR OF THE OCEAN LEVELING ITS SURFACE. THIS MAKES THE EFFECTS OF EROSION UNNOTICEABLE.
B. THE OCEAN FLOOR IS FREE FROM ANY FORCES OF EROSION, AND, THEREFORE, HAS A NATURAL PROTECTION AGAINST ALTERATION OF ITS SURFACE FEATURES.
*C. THE EROSION FORCES OF WIND, SUN, AND FALLING WATER ARE ONLY CONNECTED WITH LAND EROSION; WHEREAS, THE SEA HAS TO ONLY CONTEND WITH WATER EROSION.

The student can recall definitions of weathering and erosion by selecting them from a list.

Choose the correct answer.

WEATHERING IS CAUSED BY
A. WATER AND WIND.
B. HEAT, COLD AND FREEZING WATER.
*C. PLANTS.
*D. BOTH B AND C.

EROSION IS CAUSED BY
A. HEAT, COLD AND FREEZING WATER.
*B. WATER AND WIND.
*C. PLANTS.
WEATHERING CAN BE DEFINED AS THE
A. BREAKING DOWN OF ROCK.
B. WEARING AWAY OF THE EARTH'S SURFACE.
C. CARRYING AWAY OF THE EARTH'S SURFACE.

EROSION CAN BE DEFINED AS THE
A. BREAKING DOWN OF ROCK.
B. WEARING AWAY OF THE EARTH'S SURFACE.
C. CARRYING AWAY OF THE EARTH'S SURFACE.
D. BOTH B AND C.

THE DOME SHAPE OF A MOUNTAIN IS PROBABLY CAUSED BY
A. WEATHERING.
B. EROSION.
C. BOTH A AND B.
D. NONE OF THE ABOVE.
GIVEN PICTURES OF GEOLOGICAL FORMATIONS, THE STUDENT CAN APPLY THE DEFINITIONS OF EROSION AND WEATHERING TO PREDICT THEIR PROBABLE CAUSES. *5*

 NEED DIAGRAMS OF THE FOLLOWING:

STUDY THE FOLLOWING PICTURES AND THEN ANSWER THE QUESTIONS WHICH FOLLOW.

PICTURE
A - RIVER VALLEY
B - DESERT
C - CRACKED ROCK %NO PLANTS ON OR NEAR ROCK%
D - GULLY
E - LICHEN COVERED ROCK

IN PICTURE A, PROBABLY THE MAIN FORCE WHICH SHAPED THIS LAND WAS
A. WIND.
B. PLANT GROWTH.
*C. WATER.*
D. ICE.

IN PICTURE B, PROBABLY THE MAIN FORCE WHICH SHAPED THIS LAND WAS
A. ICE.
*B. WIND.
C. PLANT GROWTH.
D. WATER.

IN PICTURE C, PROBABLY THE MAIN FORCE WHICH CRACKED THIS ROCK WAS
*A. FREEZING WATER.*
B. PLANT GROWTH.
C. WIND.
D. A SMALL ANIMAL.

IN PICTURE D, PROBABLY THE MAIN FORCE WHICH CHANGED THIS LAND WAS
A. WIND.
*B. PLANT GROWTH.
C. ICE.
D. WATER.

IN PICTURE E, PROBABLY THE MAIN FORCE WHICH CHANGED THIS ROCK WAS
A. WATER.
B. PLANT GROWTH.
C. WIND.
*D. ICE.*

THE STUDENT CAN APPLY INFORMATION ABOUT SEDIMENTARY ROCK FORMATION BY CHOOSING FROM A LIST, THE PROBABLE CAUSES AND EFFECTS OF SEDIMENTATION IN SITUATIONS. *3*

CHOOSE THE CORRECT ANSWER.

THERE ARE FOUR LAYERS OF SEDIMENTARY ROCK. LAYER W IS ON THE BOTTOM, LAYER X IS ON TOP OF W, Y IS ON TOP OF X, AND Z IS THE TOP MOST LAYER. WHICH LAYER IS THE OLDEST?
*A. LAYER W.
B. LAYER X.
C. LAYER Y.
D. LAYER Z.

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THE STUDENT CAN APPLY INFORMATION ABOUT SEDIMENTARY ROCK FORMATION BY CHOOSING FROM A LIST, THE PROBABLE CAUSES AND EFFECTS OF SEDIMENTATION IN SITUATIONS. *3*

CHOOSE THE CORRECT ANSWER.

THERE ARE FOUR LAYERS OF SEDIMENTARY ROCK. LAYER W IS ON THE BOTTOM, LAYER X IS ON TOP OF W, Y IS ON TOP OF X, AND Z IS THE TOP MOST LAYER. WHICH LAYER IS THE OLDEST?
*A. LAYER W.
B. LAYER X.
C. LAYER Y.
D. LAYER Z.
SOME SEDIMENTARY ROCK IS MADE OF VERY FINE SEDIMENTS. WHAT KIND OF RIVER BROUGHT THE FINE SEDIMENTS?

- A. ONE THAT WAS MOVING SLOWLY.
- B. ONE THAT WAS MOVING MODERATELY.
- C. ONE THAT WAS MOVING FAST.

THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF EARTHQUAKES BY SELECTING THE CAUSES, LOCATIONS, AND SIGNIFICANCE OF THEIR OCCURRENCE. %5?

CHOOSE THE CORRECT ANSWER.

WHAT IS THE MAIN CAUSE FOR AN EARTHQUAKE?

- A. ROCK LAYERS SHIFTING TO A NEW POSITION.
- B. THE CORE OF THE EARTH PUSHING ON THE MANTLE.
- C. SOUND WAVES.

IN WHAT LAYER OF THE EARTH DO EARTHQUAKES OCCUR?

- A. CORE
- B. MANTLE
- C. CRUST

SEISMOGRAPHS MEASURE EARTHQUAKE WAVES WHICH TRAVEL

- A. AROUND THE EARTH.
- B. THROUGH THE EARTH.
- C. ALONG THE SURFACE OF THE EARTH'S CRUST.

SEISMOGRAPHS ARE IMPORTANT BECAUSE THEY

- B. PREDICT WHEN EARTHQUAKES WILL OCCUR.
- C. PREDICT WHERE EARTHQUAKES WILL OCCUR.

WHERE WOULD BE THE SAFEST PLACE TO BUILD A HOUSE IN AN EARTHQUAKE BELT?

- A. AT THE SEACOAST
- B. ON AN INLAND PLAIN
- C. IN A VALLEY
- D. ON A HILLSIDE

THE STUDENT WILL SHOW HIS UNDERSTANDING OF THE ROCK CYCLE BY ANSWERING CORRECTLY A SERIES OF QUESTIONS CONCERNING THE DIFFERENCES AND RELATIONSHIPS BETWEEN THE ROCKS. %8?

CHOOSE THE CORRECT ANSWER.

SINCE WE HAVE NO WITNESSES TO THE BEGINNING OF THE EARTH, WE CANNOT BE SURE OF WHAT KINDS OF ROCK WERE FIRST FORMED. USING WHAT YOU KNOW ABOUT THE CONDITIONS UNDER WHICH ROCK FORMS, WHAT TYPE OF ROCK WAS PROBABLY THE FIRST KIND FORMED ON EARTH?

- A. IGNEOUS
- B. SEDIMENTARY

A: LAYER X
B: LAYER Y
C: LAYER Z
D: LAYER Z
IN THE ROCK CYCLE, WHAT IS THE RELATIONSHIP BETWEEN MAGMA AND IGNEOUS ROCK?

A. MAGMA CONTAINS ALL THE MINERALS FOUND IN IGNEOUS ROCK.
B. MAGMA AND IGNEOUS ROCK ARE BOTH FOUND UNDERGROUND.
C. MAGMA COOLS AND HARDENS INTO IGNEOUS ROCK.
D. MAGMA AND IGNEOUS ROCK HAVE TREMENDOUS PRESSURE ON THEM.

WHICH OF THE FOLLOWING IS *NOT* AN AGENT OF WEATHERING?

A. WATER
B. HEAT
C. WIND
D. ICE

WHILE DRIVING IN A HILLY AREA, YOU COME UPON A VALLEY WHOSE SIDES FORM A VALLEY. YOU NOTICE HOWEVER THAT THERE IS *NO* STREAM IN THE BOTTOM OF THE VALLEY. YOU HIKE DOWN TO THE BOTTOM TO TAKE A CLOSER LOOK. YOU DISCOVER SAND, PEBBLES, AND LARGE BOULDERS AT THE BOTTOM OF THE VALLEY. THE PEBBLES AND BOULDERS ARE MADE OF GRANITE BUT THE VALLEY WALLS ARE MADE OF LIMESTONE. THE VALLEY IS A RESULT OF

A. GLACIAL EROSION.
B. TEMPERATURE VARIANCE.
C. EARTHQUAKE ACTIVITY.
D. STREAM EROSION.

THE DEPOSITION OF THE SAND, PEBBLES AND LARGE BOULDERS UPON LITHIFICATION WILL BECOME WHAT *TYPE* OF ROCK?

A. SEDIMENTARY
B. IGNEOUS
C. METAMORPHIC

OF THE TWO TYPES OF WEATHERING, WHICH TYPE PLAYED A GREATER PART IN CREATING THE VALLEY AND DEPOSITING THE SEDIMENTS?

A. CHEMICAL WEATHERING BECAUSE THE SEDIMENTS WERE SPLIT ORIGINALLY FROM A SOLID CLIFF.
B. MECHANICAL WEATHERING BECAUSE ABRASION SMOOTHED THE SEDIMENT SHAPE.
C. CHEMICAL WEATHERING BECAUSE THE STREAM WHICH CUT THE VALLEY WAS REALLY A CO.
D. MECHANICAL WEATHERING BECAUSE ABRASION CUT THE VALLEY AND THE STREAM DEPOSITED THE SEDIMENTS.

IN THE ROCK CYCLE, WHAT IS THE RELATIONSHIP BETWEEN IGNEOUS AND SEDIMENTARY ROCKS?

A. IGNEOUS ROCKS MELT CAUSING THE HEAVY CRYSTALS TO SETTLE OUT AND COOL TO FORM SEDIMENTARY ROCKS.
B. IGNEOUS ROCKS WEATHER, ARE DEPOSITED BY WATER, WIND, OR ICE, ARE LITHIFIED AND FORM SEDIMENTARY ROCKS.
C. IGNEOUS ROCKS FREEZE, CRACK APART, ARE SOLIDIFIED, AND FORM SEDIMENTARY ROCKS.
D. IGNEOUS ROCKS DROP TO THE BOTTOM OF THE SEA, BECOME WATER LOGGED AND ARE CALLED SEDIMENTARY ROCKS.

YOUR LITTLE BROTHER FINDS A BOULDER WHICH SEEMS TO BE MADE OF SANDSTONE. BUT WHEN LOOKING AT IT YOU NOTICE A 4 INCH LAYER ABOUT IN THE MIDDLE THAT IS DIFFERENT FROM THE OTHER LAYERS IN THE BOULDER. THIS MIDDLE LAYER IS OF THE SAME COLOR AND MATERIAL.
AS THE REMAINDER OF THE BOULDER BUT YOU CANNOT PICK OUT THE
INDIVIDUAL GRAINS OF SAND IN THIS LAYER. WHAT KIND OF ROCK IS
THE MIDDLE LAYER?
A. SANDSTONE WITH TINY GRAINS
B. MARBLE WITH SAND MIXED IN
*C. PURF QUARTZITE
D. THE SANDSTONE'S ORIGINAL GRANITE

THE STUDENT WILL SHOW HIS UNDERSTANDING OF THE USE OF THE VARIOUS
MINERAL TESTING TECHNIQUES BY JUDGING THE SUITABILITY OF A
TECHNIQUE IN GIVEN SITUATIONS. %3b

CHOOSE THE CORRECT ANSWER.

YOU HAVE BEEN GIVEN A BOX OF UNIDENTIFIED MINERALS AND ARE TOLD
TO IDENTIFY THEM. WHICH OF THE FOLLOWING WOULD NOT HELP YOU?
A. MOHS HARDNESS SCALE
B. LUSTER OBSERVATION
C. STREAK TEST
D. RICHTER SCALE

TWO MINERAL SPECIMENS ARE ALIKE IN COLOR, WEIGHT, STREAK COLOR,
CLEAVAGE AND LUSTER. ARE THE SPECIMENS THE SAME MINERAL?
A. POSSIBLY -- TRY HARDNESS TEST
B. DEFINITELY -- HARDNESS CAN VARY IN SPECIMENS
C. POSSIBLY -- TRY CRACKING SPECIMENS
D. DEFINITELY -- STREAK TEST IS CONCLUSIVE

THE COLOR TEST IS OF LEAST VALUE IN DETERMINING A MINERAL
IDENTITY BECAUSE MINERAL COLOR
A. CANNOT ALWAYS BE DETERMINED.
B. VARIES IN SPECIMENS DUE TO IMPURITIES.
C. CHANGES WITH WEATHER CONDITIONS.
D. CAN BE SHARED BY MANY MINERALS.

THE STUDENT WILL SHOW HIS UNDERSTANDING OF THE USE OF THE MINERAL
IDENTITY TESTS BY CHOOSING THE CHARACTERISTIC A TEST TESTS FROM A
LIST OF ALTERNATIVES. %2a

CHOOSE THE CORRECT ANSWER.

SPLITTING A SPECIMEN CAN BE HELPFUL IN IDENTIFYING A MINERAL.
WHAT CHARACTERISTIC IS BEING TESTED IN THIS TEST?
A. CLEAVAGE
B. HARDNESS
C. STREAK
D. FORM

HCL IS DROPPED ON A SPECIMEN. BUBBLES FORM WHERE THE DROP WAS
PLACED. WHAT CAN YOU CONCLUDE?
A. THE MINERAL HAS NACI IN IT.
B. THE MINERAL SHOULD BE TESTED FURTHER.
C. THE MINERAL IS DISSOLVING.
D. THE MINERAL HAS SALT IN IT.
THE STUDENT WILL SHOW HIS UNDERSTANDING OF MAGMA AND LAVA BY IDENTIFYING THE DIFFERENCES BETWEEN THEM AND THE CONDITIONS FOR THEIR EXISTENCE.

CHOOSE THE CORRECT ANSWER.

THE DIFFERENCE BETWEEN MAGMA AND LAVA IS
A. MAGMA IS PLASTIC ROCK AND LAVA IS LIQUID ROCK.
B. MAGMA IS FOUND UNDERGROUND AND LAVA IS FOUND AT THE SURFACE.
C. MAGMA IS FOUND AT THE SURFACE AND LAVA IS FOUND UNDERGROUND.
D. MAGMA IS LIQUID ROCK AND LAVA IS PLASTIC ROCK.

WHERE MAGMA ORIGINATES, THE TEMPERATURE IS HIGH ENOUGH TO MELT MOST ROCK AND YET VERY LITTLE MAGMA IS PRODUCED HERE. WHY?
A. THE PRESSURE IS TOO GREAT TO ALLOW LIQUID FORMATION.
B. THE HEAT IS NOT GREAT ENOUGH TO MELT MAGMA ROCK.
C. THERE IS NOT ENOUGH WATER AT THIS DEPTH TO FORM MAGMA.
D. THERE IS TOO MUCH HEAT CAUSING THE ROCK TO BECOME A GAS.

WHICH LAYER IN THE EARTH IS RESPONSIBLE FOR MAGMA FORMATION?
A. INNER CORE
B. OUTER CORE
C. CRUST
D. MANTLE
THE ABOVE IS A CROSS SECTIONAL AREA FROM A VOLCANIC REGION.

NOTICE THE NUMBERED AREAS. CHOOSE THE NAME FOR EACH NUMBERED AREA FROM THE POSSIBLE NAMES BELOW:

A. DIKE
B. PLUG
C. MOLT
D. VOLCANO
E. BATHOLITH
F. SILL
G. RESERVOIRS
H. GASES
I. LAVA FLOW
J. LACOLITH

AREA 1  *A
AREA 2  *D
AREA 3  *I
AREA 4  *J
AREA 5  *F
AREA 6  *E

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THE STUDENT WILL SHOW HIS UNDERSTANDING OF THE DIFFERENCES IN VARIOUS VOLCANIC ERUPTIONS BY MATCHING AN ERUPTION WITH ITS CHARACTERISTICS.

THE FOLLOWING IS A LIST OF SEVERAL VOLCANIC ERUPTIONS. BENEATH THIS LIST IS ANOTHER LIST OF THE PARTS OF AN ERUPTION WHICH MAKE CERTAIN ERUPTIONS IMPORTANT. MATCH THE NAME OF THE ERUPTION WITH THE PART WHICH MAKES IT IMPORTANT.

A. FIERY CLOUD
B. CINDER CONE
C. EXPLOSIVE VOLCANO
D. SHIELD
E. GAS AND DUST CLOUDS

KRAKATOA, 1883  *C
VESUVIUS, 79 AD  *E
PARICUTIN, 1943  *B
HAWAII ISLANDS VOLCANOES *D
MOUNT FUJIYAMA *B
MT PELEE *A
SURTSEY, 1963  *C

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IDENTIFYING THE PARTS OF EARTHQUAKE STUDY.

CHOOSE THE CORRECT ANSWER.

MOVEMENT ALONG A FAULT IS CALLED A:
A. EARTHQUAKE.
B. NONCONFORMITY.
C. JOINT.
D. ANTICLINE.

A FAULT CAN BE DEFINED AS:
A. AREA OF UNCONFORMITY IN THE CRUST.
B. LOCATION OF VOLCANIC ACTIVITY IN THE CRUST.
C. PLACE WHERE ROCK LAYERS BEND.
D. SECTION OF WEAKNESS IN THE CRUST.

EARTHQUAKES VARY IN INTENSITY. THEIR STRENGTH HAS BEEN PLOTTED ON A STANDARD SCALE NAMED AFTER:
A. ROSSI.
B. RICHTER.
C. ROBERTS.
D. RICHARDS.

EARTHQUAKES HAVE BEEN STUDIED BY GEOLOGISTS AND THE SHEAR WAVES AND PRESSURE WAVES WHICH ARE CAUSED BY EARTHQUAKES HAVE BEEN CLOCKED ON SEISMOGRAPHS. OF WHAT PURPOSE IS THIS STUDY?
A. TO PREDICT WHEN EARTHQUAKES WILL OCCUR.
B. TO DETERMINE THE AMOUNT OF ENERGY RELEASED.
C. TO DISCOVER THE COMPOSITION OF THE EARTH'S LAYERS.
D. TO PREDICT PRODUCTION OF A SEISMIC SEA WAVE.
The above are illustrations of the 3 types of faults. Answer the following questions:

Which of the above is a normal fault? *B

Which of the above is a strike-slip fault? *A

Which of the above illustrate the hanging wall as having moved downward? *C

Which of the above is the San Andreas fault an example of? *A

The student will show his ability to identify the ages of streams by choosing the characteristics of each age. *9a
THE ABOVE IS A DIAGRAM OF A STREAM VALLEY BOTH AT FACE VALUE AND CROSS SECTION. NOTICE THE AREAS LABELED WITH A NUMBER. DECIDE IF CONSIDERING THE AREA LABELED BY THAT NUMBER COULD HELP DETERMINE THE AGE OF THE STREAM. IF YES, CHOOSE *A*, IF NO, CHOOSE *B*.

AREA 1   *B*  
AREA 2   *B*  
AREA 3   *A*  
AREA 4   *B*  
AREA 5   *A*  
AREA 6   *A*  

CHOOSE THE CORRECT ANSWER.

IN THE ABOVE DIAGRAM, THE STREAM'S AGE IS PROBABLY THAT OF
A. BIRTH.
B. YOUTH.
*C. MIDDLE AGE.*
D. OLD AGE.
THE ABOVE DIAGRAM IS THAT OF A CROSS SECTION OF A YOUNG STREAM.  
THE VALLEY WALLS ARE VERTICAL AND DO NOT FORM THE V SHAPE VALLEY 
CHARACTERISTIC OF YOUNG STREAMS.  WHY?
A. MASS MOVEMENT AND SLOPE WASH HAVEN'T HAD TIME TO SLANT THE 
   SIDES.
B. NOT ALL YOUNG STREAMS HAVE V SHAPE VALLEY.
C. THIS STREAM DOES NOT UNDERCUT THE SIDES CAUSING CAVE INS.
D. A WATERFALL CUT THIS PARTICULAR AREA OF THE VALLEY.

ALL THE FOLLOWING ARE CHARACTERISTICS OF OLD AGE STREAMS EXCEPT
A. WIDER THAN MEANDER BELT FOOD PLANE
B. OXBOW LAKES, MEANDER SCARS
C. RAPIDS AND SMALL WATERFALLS
D. CHANGING STREAM COURSE

THE STUDENT WILL DEMONSTRATE KNOWLEDGE OF THE EFFECTS OF GLACIATION
ON LAND FORMS BY IDENTIFYING THEIR EFFECTS.  %30

CHOOSE THE CORRECT ANSWER.

THE KINDS OF CHANGE IN LAND FEATURES CAUSED BY GLACIERS DEPENDS
FROM THE GLACIER'S TYPE.  VALLEY GLACIERS CUT DEEP, WIDE U-SHAPED 
VALLEYS; USE THE ROCK DEBRIS THEY PICK UP TO GOUGE OUT THE LAND 
AND GENERALLY MAKE THE LAND RUGGED.  CONTINENTAL GLACIERS
A. ACT THE SAME AS VALLEY GLACIERS ONLY THEY ARE THICKER.
B. TEND TO FLATTEN AND ROUND OFF THE LAND LEAVING MORAINES.
C. ACT DIFFERENTLY FROM VALLEY GLACIERS BUT UNKNOWN HOW 
   DIFFERENT.
D. TEND TO CUT V-SHAPED WHICH LATER STREAMS FROM THE GLACIER 
   WILL USE.

WORLDWIDE*, GLACIERS ARE RESPONSIBLE FOR ALL OF THE FOLLOWING
EXCEPT*
A. MINERAL PRODUCTION.
B. SCRATCHED ROCK.
C. HANGING VALLEYS.
D. DRUMLINS.
E. CIRQUES.

WORLDWIDE*, GLACIERS ARE RESPONSIBLE FOR ALL OF THE FOLLOWING
EXCEPT*
A. ICEBERGS.
B. SOIL TRANSPORT.
C. MORAINES.
D. WAPNES.
E. VALLEY TERRACES.

THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE OF THE FORMATION AND
CHARACTERISTICS OF GLACIAL MOVEMENT BY IDENTIFYING THE PRINCIPLES 
INVOLVED IN BOTH FORMATION AND MOVEMENT.  %30

CHOOSE THE CORRECT ANSWER.

AFTER A HEAVY SNOWFALL, YOU AND A FRIEND RUN OUTSIDE AND START

A. SNOWFLAKES FLYING.
B. SNOW-CLAD PINE TREES.
C. SNOW COVERED ROOFTOPS.
D. SNOWY MEADOWS.
E. ICE CRYSTALS.
Handful it turns to ice. This is an example of
A. Lithification.
B. Sedimentation.
C. Chemical change.
D. Snow compression.

The above situation is similar to glacier formation, but what in nature converts a snow field to a glacier?
A. Mechanical weathering caused the melted snow to become ice.
B. Weight of the overlying layers cause lower layers to become ice.
C. Rocks falling from cliffs along side the snowfield caused the ice.
D. Sediment deposited by streams on the glacier cause the ice.

Scientists tell us that glaciers move. How can a huge layer of ice move?
A. The weight of the ice causes it to move in any direction.
B. The sun melts the ice and makes a puddle which flows.
C. The pressure of the upper layers causes the lower layers to move in response to gravity.
D. The attraction between the large mass of ice and a mountain caused it to move.

The student can apply concepts of rock formation by identifying the class to which sample rocks belong.

Teachers note - number *only* the following rock specimens the same as below.

ROCK 1 - SLATE
ROCK 2 - GRANITE
ROCK 3 - LIMESTONE
ROCK 4 - SANDSTONE
ROCK 5 - PUDDINGSTONE
ROCK 6 - MARBLE
ROCK 7 - CHALK
ROCK 8 - SHALE

Choose which group each of the following rock specimens belong in.
A. Igneous.
B. Sedimentary.
C. Metamorphic.

ROCK 1 IS CLASSIFIED AS *C
ROCK 2 IS CLASSIFIED AS *A
ROCK 3 IS CLASSIFIED AS *B
ROCK 4 IS CLASSIFIED AS *B
ROCK 5 IS CLASSIFIED AS *B
ROCK 6 IS CLASSIFIED AS *C
ROCK 7 IS CLASSIFIED AS *B
ROCK 8 IS CLASSIFIED AS *B
Choose the correct word to complete each relationship.

Magma is to igneous rock as water is to

A. Hot
B. Ice
C. Steam
D. Energy

Intelligence is to man as crystals are to

A. Igneous rocks
B. Salt
C. Gem stones
D. Sediments

Granite is to obsidian as a wife is to

A. Mother
B. Lady
C. A Miss
D. Grandmother

Basalt is to

A. Granite
B. Gneiss
C. Rock
D. Diamond

Raw egg is to boiling water as sediment is to

A. Soft
B. Lithification
C. Weathering
D. Sand

Chlorophyll is to plants as

A. Sand
B. Caco
C. Layering
D. Water

Wind cracks and ripple marks are to sedimentary rocks as

A. Words and pages
B. Pages and a cover
C. Dictionaries and bibles
D. Reading and seeing

Blue is to red as slate is to

A. Gneiss
B. Shale
C. Granite
D. Limestone

Big is to adult elephants as banding of minerals is to

A. Sedimentation
B. Granite
C. Limestone
D. Obsidian
THE STUDENT WILL SHOW HIS KNOWLEDGE OF A SOIL PROFILE BY ANSWERING QUESTIONS CONCERNING THE RATIONALE OF A SOIL PROFILE. 

ZONE A REPRESENTS THE TOPSOIL OR UPPERMOST LAYER. NEXT COMES ZONE B AND SO ON. ANSWER THE FOLLOWING QUESTIONS.

IN WHAT ZONE WOULD YOU EXPECT TO FIND SAND, GRAVEL AND LARGE PIECES OF BEDROCK?
A. ZONE A  
B. ZONE B  
C. ZONE C  
D. ZONE D

WHAT ZONE WOULD BE MADE OF CONSOLIDATED MATERIAL?
A. ZONE A  
B. ZONE B  
C. ZONE C  
D. ZONE D

THE RAGGED LINE AT THE BOTTOM OF ZONE D INDICATES THAT:
A. THE PERSON WHO DREW THE LINE OBVIOUSLY DID NOT KNOW THAT ZONE D ENDS SHARPLY. 
B. THE ZONE DOES NOT END AT THE RAGGED LINE BUT CONTINUES DOWNWARD. 
C. THERE IS ANOTHER ZONE IN THE PROFILE WHICH IS NOT SHOWN. 
D. ZONE D BLENDS INTO THE ZONE BELOW IT.

THE SEPARATING LINES BETWEEN ZONES ARE STRAIGHT INDICATING SHARP DIVISIONS. IN NATURE IS THIS FOUND?
A. YES, BECAUSE MINERAL ARE IN LAYERS. 
B. NO, BECAUSE ONE ZONE BLENDS INTO ANOTHER. 
C. YES, AND NO, DEPENDING UPON THE AREA. 

THE FERTILITY OF THE SOIL IS DEFINED AS THE ABILITY TO SUPPORT PLANT LIFE. SOIL FERTILITY IS *ORIGINALY* DEPENDENT UPON:
A. THE MINERALS FOUND IN ZONE A. 
B. THE AMOUNT OF FERTILIZER IN THE SOIL. 
C. THE MINERALS FOUND IN THE BEDROCK. 
D. THE AMOUNT OF CROPS HARVESTED.

THE SOIL PROFILE IS THE LAYERING WITHIN THE:
A. EARTH. 
B. MANTLE. 
C. CORE. 
D. CRUST.

THE STUDENT WILL KNOW THE MEANING OF OCEANOGRAPHY BY SELECTING:

OCEANOGRAPHY
ITS CORRECT DEFINITION. %10

CHOOSE THE CORRECT ANSWER.

OCEANOGRAPHY IS DEFINED AS

A. THE STUDY OF OCEANS AS THEY RELATE TO THE LAND FORMS AROUND THEM. 2400470
B. THE SCIENTIFIC STUDY OF OCEANS INCLUDING THEIR HISTORY, CHEMISTRY, AND ANIMAL LIFE LIVING IN THEM. 2400470
C. THE SCIENTIFIC STUDY OF OCEANS AS THEY RELATE TO THE GLACIAL AGE. 2400470

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WEATHER

THE STUDENT CAN RECALL THE DEFINITION OF THE WATER CYCLE BY SELECTING IT WHEN GIVEN ITS DEFINITION. %10

CHOOSE THE CORRECT ANSWER.

THE PROCESS OF EVAPORATION, CONDENSATION AND PRECIPITATION IS KNOWN AS THE

A. WATER CYCLE. 2400119
B. LIFE CYCLE. 2400119
C. OXYGEN CYCLE. 2400115
D. ENERGY CYCLE. 2400119

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THE STUDENT CAN EXTRAPOLATE FROM GIVEN INFORMATION TO FORM CONCLUSIONS ABOUT WEATHER. %10

CHOOSE THE CORRECT ANSWER.

IN THE WINTER, HOW WOULD THE AVERAGE TEMPERATURE CLOSE TO A LAKE COMPARE WITH THAT OF AREAS FARHER FROM THE LAKE?

A. IT WOULD BE HIGHER BY THE LAKE. 2400184
B. IT WOULD BE LOWER BY THE LAKE. 2400184
C. THE TEMPERATURES WOULD BE THE SAME. 2400184
D. IT WOULD BE HIGHER BY THE LAKE AT NIGHT AND LOWER DURING THE DAY. 2400184

IN THE SUMMER, HOW WOULD THE AVERAGE TEMPERATURE CLOSE TO THE LAKE COMPARE WITH THAT OF AREAS FARHER FROM THE LAKE?

A. IT WOULD BE HIGHER BY THE LAKE. 2400185
B. IT WOULD BE LOWER BY THE LAKE. 2400185
C. THE TEMPERATURES WOULD BE THE SAME. 2400185
D. IT WOULD BE HIGHER BY THE LAKE AT NIGHT AND LOWER DURING THE DAY. 2400185

A SEA BREEZE IS MOST LIKELY TO OCCUR

A. ON A SUNNY DAY. 2400186
B. AT NIGHT. 2400186
C. IN THE WINTER. 2400186
A LAND BREEZE IS *MOST* LIKELY TO OCCUR
A. ON A SUNNY DAY.
*B. ON A SUMMER NIGHT.
C. IN THE WINTER.
D. IN THE MORNING.

**THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF WEATHER BY**
DISTINGUISHING BETWEEN WEATHER SAYINGS THAT HAVE SOME SCIENTIFIC
BASIS AND THOSE THAT ARE SUPERSTITIONS. %20

CHOOSE THE CORRECT ANSWER.

WHICH WEATHER SAYING IS A SUPERSTITION?
A. THE NORTH WIND DOETH BLOW AND WE SHALL HAVE SNOW.
*B. IF THE GROUNDHOG SEES HIS SHADOW ON FEBRUARY 2, WE WILL HAVE SIX MORE WEEKS OF WINTER.
C. WHEN THE WIND VEERS TO THE EAST TIS GOOD FOR NEITHER MAN NOR BEAST.
D. EVENING RED AND MORNING GRAY HELPS THE TRAVELER ON HIS WAY.
EVENING GRAY AND MORNING RED BRINGS DOWN RAIN UPON HIS HEAD.

WHICH OF THE FOLLOWING WEATHER SAYINGS IN *NOT* A SUPERSTITION?
A. IF MARCH COMES IN LIKE A LION, IT WILL GO OUT LIKE A LAMB.
*B. IF IT RAINS ON EASTER, IT WILL RAIN THE SEVEN FOLLOWING SUNDAYS.
*C. IF THERE IS A RING AROUND THE MOON, IT WILL SOON RAIN OR SNOW.
D. IF THE GROUNDHOG SEES HIS SHADOW ON FEBRUARY 2, WE WILL HAVE SIX MORE WEEKS OF WINTER.

**THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF VARIOUS WEATHER INSTRUMENTS BY SELECTING THE USES FOR EACH. %20

CHOOSE THE CORRECT ANSWER.

A BAROMETER IS USED TO MEASURE
A. TEMPERATURE.
B. WIND DIRECTION.
*C. HUMIDITY.
*D. AIR PRESSURE.
E. PRECIPITATION.

TO MEASURE TEMPERATURE, WE USE
A. A THERMOMETER.
*B. A HYGROMETER.
C. A BAROMETER.
D. AN ANEMOMETER.

A WEATHER VANE TELLS US ABOUT THE
A. HUMIDITY.

*B. WIND DIRECTION.*
C. WIND SPEED.
D. PRECIPITATION.

TO MEASURE WIND SPEED WE USE
A. A SPEEDOMETER.
B. AN ANEMOMETER.
C. A BAROMETER.
D. A THERMOMETER.

TO MEASURE THE AMOUNT OF MOISTURE IN THE AIR WE USE
A. A HYGROMETER.
B. A RAIN GAUGE.
C. CLOUDS.
D. HURRICANES.

WE MEASURE WITH A RAIN GAUGE.
A. HUMIDITY.
B. WEATHER.
*C. PRECIPITATION.
D. HURRICANES.

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THE STUDENT WILL SHOW KNOWLEDGE OF THE TERM METEOROLOGIST BY SELECTING THE CORRECT AREA OF STUDY. %1

CHOOSE THE CORRECT ANSWER.

A. METEOROLOGIST IS A SCIENTIST WHO STUDIES
A. SOIL.
B. METERS.
*C. ATMOSPHERE.
D. EARTH.

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THE STUDENT CAN APPLY THE CONCEPT THAT HEAT IS ABSORBED BY WATER AS IT EVAPORATES BY SELECTING THE CONCEPT THAT IS RELEVANT TO A PRESCRIBED SITUATION. %2

CHOOSE THE CORRECT ANSWER.

A PERSON FEELS COOL WHEN STANDING IN A BREEZE IN A WET BATHING SUIT. THIS OCCURRENCE CAN BE EXPLAINED BY WHICH OF THE FOLLOWING.
A. WARM AIR IS LIGHTER THAN COLD AIR.
B. THE SUN HEATS THE EARTH UNEVENLY.
*C. HEAT IS ABSORBED BY WATER AS IT EVAPORATES.
D. THE RATE OF EVAPORATION INCREASES AS THE TEMPERATURE INCREASES.

SOME WET COTTON IS WRAPPED OVER THE BULB OF ONE OF TWO THERMOMETERS SHOWING THE SAME TEMPERATURE. BOTH THERMOMETERS ARE FANNED. WHAT HAPPENS?
A. THE TEMPERATURE OF THE COTTON THERMOMETER IS HIGHER.
B. THE TEMPERATURE OF THE COTTON THERMOMETER IS LOWER.
C. THERE IS NO DIFFERENCE IN TEMPERATURE.
D. THE TEMPERATURE OF BOTH THERMOMETERS CRUSHS.
THE TEMPERATURE OF BOTH THERMOMETERS RISES.

THE STUDENT CAN ANALYZE THE RELATIONSHIPS AMONG A GIVEN SET OF FACTS BY SELECTING THOSE MOST RELEVANT FOR THE EXPLANATION OF A PHENOMENON **DESTRUCTION BY TORNADOES**. **2**

**USE THESE FOUR CHARACTERISTICS OF TORNADOES TO ANSWER QUESTIONS.**

1. TORNADOES ARE FUNNEL SHAPED.
2. THE WIND SPEED WITHIN THE FUNNEL OFTEN REACHES 500 MILES AN HOUR.
3. THE AIR PRESSURE AT THE CENTER IS LOW.
4. TORNADOES GENERALLY MOVE FROM SOUTHWEST TO NORTHEAST.

**WHICH OF THE STATED CHARACTERISTICS ACCOUNTS FOR THE DESTRUCTIVE POWER OF TORNADOES?**

A. 1 AND 2.
B. 1 AND 3.
C. 2 AND 3.
D. 2 AND 4.
E. 3 AND 4.

WHEN A TORNADO IS APPROACHING, YOU SHOULD OPEN THE WINDOWS ON THE EAST OR NORTHEAST SIDE OF YOUR BUILDING BECAUSE

A. 1 AND 2.
B. 2 AND 3.
C. 2 AND 4.
D. 3 AND 4.

**THE STUDENT CAN RECOGNIZE THE FACTORS THAT INFLUENCE THE RATE AT WHICH WATER EVAPORATES BY SELECTING THE FACTOR THAT DOES NOT.**

**CHOOSE THE CORRECT ANSWER.**

**THE RATE AT WHICH WATER EVAPORATES DEPENDS ON ALL OF THE FOLLOWING **EXCEPT**

A. BAROMETRIC PRESSURE.
B. TEMPERATURE.
C. RELATIVE HUMIDITY.
D. WIND.

**THE STUDENT WILL SHOW KNOWLEDGE OF THE TERM ATMOSPHERE BY SELECTING ITS CORRECT DEFINITION.**

**CHOOSE THE CORRECT ANSWER.**

OF THE FOLLOWING, THE ONE WHICH IS THE BEST DEFINITION OF ATMOSPHERE IS

A. THE AIR POLLUTION ABOVE US.
B. THE ENVELOPE OF AIR AROUND THE EARTH.
C. OUTER SPACE.
D. BALL OF AIR IN SPACE.
AFTER STUDYING THE ATMOSPHERE, THE CHILD WILL KNOW THE LAYERS OF THE ATMOSPHERE By IDENTIFYING THEM FROM A LIST.  

CHOOSE THE CORRECT ANSWER.

OF THE FOLLOWING, THE ONE WHICH IS *NOT* A LAYER OF THE ATMOSPHERE IS

A. EXOSPHERE.
B. HEMISPHERE.
C. TROPOSPHERE.
D. STRATOSPHERE.

OF THE FOLLOWING, THE ONE WHICH IS *NOT* A LAYER OF THE ATMOSPHERE IS

A. IONOSPHERE.
B. TROPOSPHERE.
C. STRATOSPHERE.
D. ENVOSPHERE.

THE STUDENT WILL SHOW HIS KNOWLEDGE OF THE PRINCIPLES INVOLVED IN MECHANICAL WEATHERING BY IDENTIFYING THE PRINCIPLE AND/OR ITS APPLICATION IN A GIVEN SITUATION.

CHOOSE THE CORRECT ANSWER.

SEVERAL ROCK SAMPLES HAVE BEEN HEATED OVER A BUNSEN BURNER UNTIL THEY ARE VERY HOT. THE ROCKS ARE THEN DROPPED INTO A BASIN OF ICE WATER. THE ROCKS CRACK WHEN THEY HIT THE WATER. THIS IS AN EXAMPLE OF

A. MECHANICAL WEATHERING.
B. CHEMICAL WEATHERING.
C. GLACIAL EROSION.
D. WEATHERBEATING.

THE ABOVE EXPERIMENT TOOK PLACE IN A LABORATORY. WHERE IN *NATURE* COULD EXAMPLES OF THIS EXPERIMENT TAKE PLACE?

A. STREAM BED
B. DESERT FLOOR
C. MOUNTAIN CLIFFS
D. SEA SHORE

WHAT IS THE BEST EXPLANATION FOR WHY THE ROCKS CRACKED?

A. DROPING THE ROCKS CAUSED THEM TO CRACK APART.
B. RAPID TEMPERATURE CHANGE CAUSED THEM TO CRACK APART.
C. ICE WATER CAUSES ROCKS TO CRACK APART.
D. HEAT CAUSES ROCKS TO MELT AND CRACK APART.

IF I *FILL* AN IRON PIPE WITH WATER, CLOSE BOTH ENDS TIGHTLY, PLACE THE PIPE IN A FREEZER UNTIL THE WATER FREEZES, WHAT RESULT MIGHT YOU EXPECT?

A. THE WATER WILL CRACK.
B. THE WATER WILL LEAK OUT.
C. THE END COVERS WILL EXPLODE.
D. THE IRON PIPE WILL BUST.
In the above experiment, what is the best explanation for the result?
A. Water cracks into parts when it freezes.
B. Cold water expands to exert pressure on its container.
C. Iron cracks at temperatures below 32 deg. F.
* D. Ice expands when it freezes and exerts pressure on its container.

Assuming that the above example is an illustration of mechanical weathering, what property of rocks would enable this principle to work in nature?

* A. Porosity
B. Solidity
C. Density
D. Plasticity

The student will show his understanding of chemical weathering by identifying situations in which it is a factor and/or identifying principles involved in the process.

Choose the correct answer.

When walking through an old, deserted graveyard, you observe tombstones which cannot be read and other tombstones which can be read. Upon closer inspection, you notice that the unreadable tombstones are made of limestone whereas the readable tombstones are made of granite. Dates found on the granite tombstones range from 1829 to 1900 -- dates on the limestones are unknown. What explanation for this variance in readability seems best?

A. The limestone tombstones were exposed to rain water more than the others because the others were sheltered by trees.
B. Limestone readily decomposes when combined with carbonic acid which rain water actually is.
C. Vandals obviously defaced the unreadable tombstones.
D. Explanation impossible unless further information is given.

You have bubbled some of your exhaled air into a jar of water by blowing through a straw. You then put a piece of blue litmus paper into the water and find that it turns pink. This indicates that the water is now an acid. How do you explain this?

A. Water is naturally an acid.
B. The water dissolved some of the jar creating an acid.
C. Saliva from your mouth combined with water.
D. CO2 from your breath combined with the water.

The above experiment is a lab experience. When in nature does this occur?

A. When it rains, the falling water combines with CO2 from the atmosphere.
B. When it rains, falling water combines with minerals.
FROM THE SOIL.
C. WHEN THE WIND BLOWS, AIR IS FORCED TO COMBINE WITH
WATER ON THE GROUND %STREAMS, LAKES%.
D. WATER IN THE ATMOSPHERE IS CONVERTED TO ACID BY COSMIC
RADIATION.

THE STUDENT CAN APPLY KNOWLEDGE OF WEATHER CONDITIONS IN A GIVEN
AREA BY MAKING GENERALIZATIONS RELATING TO WEATHER PATTERNS.

CHOOSE THE CORRECT ANSWER.

A WEATHER REPORT LISTED THE BAROMETRIC PRESSURE IN AN AREA AT 28.4
INCHES. WHAT TYPE OF WEATHER CONDITIONS WOULD WE EXPECT TO FIND
IN THE AREA?
A. CLEAR, COOL AND SUNNY
B. WARM, CLEAR AND SUNNY
C. SEVERE WEATHER–HURRICANE PROBABLE
D. LIGHT RAIN OR SNOW

A BAROMETRIC PRESSURE OF 28.4 INCHES *MOST LIKELY* IDENTIFIES AN
AREA IN
A. GREENLAND.
B. THE CARIBBEAN SEA.
C. MAINE.
D. ONTARIO, CANADA.

IN PREDICTING WEATHER CONDITIONS FOR CHICAGO TOMORROW, WE WOULD
BE MOST CONCERNED WITH WEATHER CONDITIONS IN
A. DES MOINES, IOWA.
B. TAMPA, FLORIDA.
C. AKRON, OHIO.
D. DETROIT, MICHIGAN.

A COOLING BREEZE IS GENERALLY PRESENT ALONG THE LAKEFRONT IN
CHICAGO. THE BREEZE TENDS TO BLOW OUT OVER THE LAKE IN THE
EVENING BECAUSE
A. THE LAKE WATER IS COOLER THAN THE LAND.
B. THE LAND IS WARMER THAN THE LAKE WATER.
C. THE LAND LOSES ITS HEAT MORE RAPIDLY THAN WATER.
D. THE LAKE WATER LOSES ITS HEAT MORE RAPIDLY THAN WATER.

THE STUDENT CAN DEMONSTRATE AN UNDERSTANDING OF THE FACTORS
CAUSING THE DIFFERENCES BETWEEN THE SEASONS BY SELECTING THE
CORRECT RESPONSE TO A GIVEN QUESTION.

CHOOSE THE CORRECT ANSWER.

WHY WOULD ONE SUMMER DAY BE COOLER THAN ANOTHER?
A. THE SUN IS FARTHER AWAY THAT DAY
B. THE SUN IS SHINING THROUGH THE CLOUDS
C. THE SUN IS SHINING LESS THAT DAY

WHY ARE SUMMER DAYS USUALLY WARMER THAN WINTER DAYS?
A. THE SUN’S RAYS ARE SLANTED MORE
B. THE SUN’S DAYS ARE LONGER
THE SUN’S RAYS ARE MORE DIRECT

WHY IS WINTER SUNLIGHT COOLER THAN SUMMER SUNLIGHT?
A. THE SUN’S RAYS ARE SHORTER
B. THE SUN’S RAYS ARE WEAKER
C. THE SUN’S RAYS ARE LESS DIRECT

WHY DO WE SAY WE HAVE SHORT WINTER DAYS?
A. WE HAVE LESS THAN 24 HOURS IN A WINTER DAY
B. WE HAVE FEWER DAYS IN THE WINTER THAN IN THE SUMMER
C. WE HAVE FEWER DAYLIGHT HOURS THAN NIGHTIME HOURS

THE STUDENT WILL DEMONSTRATE AN KNOWLEDGE OF EVAPORATION BY SELECTING AN ENDING THAT BEST COMPLETES A GIVEN ASSUMPTION. %12

CHOOSE THE CORRECT ANSWER.

SINCE EVAPORATION CHANGES WATER TO WATER VAPOR WE CAN ASSUME THAT WATER VAPOR IS USUALLY
A. DRY AND WARM AIR
B. DRY AND COLD AIR
C. MOIST AND WARM AIR
D. MOIST AND COLD AIR

USING HIS UNDERSTANDING OF THE PROCESSES INVOLVED IN THE WATER CYCLE, THE STUDENT WILL DEMONSTRATE HIS ABILITY TO DISTINGUISH FROM A GROUP OF INFERENCES THOSE THAT CAN BE CONSIDERED VALID FROM THOSE THAT WOULD BE INVALID. %58

DIRECTIONS - WHICH OF THE FOLLOWING INFERENCES COULD BE CORRECTLY MADE ABOUT THE WATER CYCLE? CHOOSE "A" IF IT IS A VALID INERENCE AND "B" IF IT IS A NON-VALID INERENCE.

WE ARE CONSTANTLY GETTING MORE WATER IN THE FORM OF RAIN THAN WE ARE LOSING BY EVAPORATION. "B"

WE ARE ALWAYS LOSING AND GAINING WATER ON EARTH. "A"

MORE WATER IS LOST FROM EVAPORATION THAN WE RECEIVE IN THE FORM OF RAIN. "B"

WATER IS BECOMING MORE SCARCE ALL THE TIME BY THE PROCESS OF EVAPORATION. "A"

THERE IS AN ENDLESS SUPPLY OF WATER FROM THE WATER CYCLE. "A"

GIVEN A HYPOTHETICAL SITUATION OF NOT HAVING WATER VAPOR, THE STUDENT WILL EXHIBIT HIS ABILITY TO APPLY HIS UNDERSTANDING OF THE VALUE OF CONDENSATION BY PREDICTING THE PROBABLE OUTCOMES OF SUCH A SITUATION. %12
FOLLOWING STATEMENTS WOULD BE PROBABLE OUTCOMES BY CHOOSING
A. TRUE
B. FALSE IF THIS WOULD NOT BE A PROBABLE OUTCOME.

WITHOUT WATER VAPOR CONDENSING IN THE AIR, CONDITIONS ON EARTH
WOULD BE VERY DIFFERENT.

THERE WOULDN'T BE GREEN PLANTS.  *A  1618
PEOPLE WOULD HAVE TO SWIM IN SWIMMING POOLS INSTEAD OF LAKES.  *B  1619
THE PRICE OF VEGETABLES WOULD GO UP.  *B  1620
PEOPLE WOULD NOT EAT MUCH FRUIT, VEGETABLES, AND FISH BUT MUCH
MEAT.  *B  1622
THERE WOULDN'T BE ANY TREES ON MOUNTAINS.  *A  1623
SEASONS OF THE YEAR WOULD BE DIFFERENT.  *A  1624
CAMELS WOULD BE VERY COMMON AND IMPORTANT ON EARTH.  *B  1626
PEOPLE WOULD NOT BUY SNOW-BLOWERS.  *A  1627

THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF THE CAUSE OF
CONDENSATION BY SELECTING FROM A LIST OF ASSUMPTIONS THOSE WHICH
INFER A HIGHER DEGREE OF PRECIPITATION.  %4n

DECIDE WHETHER MUCH PRECIPITATION CAN BE EXPECTED IN EACH OF THE
STARRED PLACES FROM READING THE STATED ASSUMPTIONS.
CHOOSE *A* FOR YES, OR *B* FOR NO.

OCEAN WINDS MOVE OVER *ISLANDS* WITH LARGE AMOUNTS OF WATER
VAPOR.  *A  1641
WINDS OVER *PLAINS* ARE USUALLY DRY.  *B  1642
*MOUNTAINS* CAUSE MOVING AIR TO RISE.  *A  1643
THE COLD AIR ABOVE THE *ARCTIC LANDS* HOLDS LITTLE MOISTURE.  *B  1644

THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF A CHANGE OF AIR
PRESSURE INDICATED BY A MERCURY BAROMETER BY SELECTING THE CHANGE
OF AIR PRESSURE IN A GIVEN SITUATION.  %2n

CHOOSE THE CORRECT ANSWER.

WHEN A MERCURY BAROMETER SHOWS RISING AIR PRESSURE, IT MEANS THAT
THE AIR PRESSURE IS BECOMING
A. STEADY.
B. GREATER.
C. LESS.

WHEN A MERCURY BAROMETER SHOWS FALLING AIR PRESSURE, IT MEANS
THAT THE AIR PRESSURE IS BECOMING
A. STEADY
B. GREATER
C. LESS

USING GIVEN INFORMATION THE STUDENT WILL DEMONSTRATE UNDERSTANDING OF BAROMETRIC READINGS OF A MERCURY BAROMETER BY SELECTING THE WEATHER CONDITIONS DIFFERENT READINGS INDICATE.

CHOOSE THE CORRECT ANSWER.

REMEMBERING THAT DRY AIR IS HEAVIER THAN MOIST AIR WHAT CAN BE EXPECTED WHEN A MERCURY BAROMETER SHOWS THE PRESSURE IS RISING?
A. CLEAR OR FAIR WEATHER
B. CLOUDING AND LIGHT RAIN
C. SEVERE WINDSTORMS

REMEMBERING THAT DRY AIR IS HEAVIER THAN MOIST AIR, WHAT CAN BE EXPECTED WHEN A MERCURY BAROMETER INDICATES FALLING PRESSURE?
A. CLEAR WEATHER
B. CLOUDINESS AND DRIZZLE
C. A STORM

THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE OF A COLD FRONT BY SELECTING THE EFFECTS A COLD FRONT HAS ON OTHER AIR MASSES.

CHOOSE THE CORRECT ANSWER.

A COLD FRONT IS WHERE A
A. WARM AIR MASS MEETS A COLD AIR MASS.
B. COLD AIR MASS SETTLES ON A WARM AIR MASS.
C. COLD AIR MASS MEETS A WARM AIR MASS.

WHEN A LARGE MASS OF COLD AIR MEETS A WARM MASS OF AIR
A. THE COLD AIR WILL MOVE OVER THE WARM AIR.
B. THE COLD AIR WILL SETTLE ON THE WARM AIR.
C. THE COLD AIR WILL MOVE THE WARM AIR UP.

IF A COLD AIR MASS IS KNOWN TO MOVE RAPIDLY AND FORCE WARM AIR UPWARD QUICKLY, THE KIND OF WEATHER WE CAN EXPECT FROM A COLD FRONT IS
A. CALM.
B. WINDY.
C. STORMY.

THE STUDENT WILL EXHIBIT A KNOWLEDGE OF THE NAMES OF THE 3 MAIN GROUPS OF CLOUD SHAPES BY CORRECTLY SELECTING THE GROUP THAT NAMES THEM.

CHOOSE THE CORRECT ANSWER.

WHICH GROUP BELOW NAMES THE 3 MAIN GROUPS OF CLOUD SHAPES?
A. STRATUS, CIRRUS, AND CUMULUS.
B. ALTO, NIMBUS, AND CIRRUS
C. STRATUS, NIMBUS, AND CUMULUS

THE STUDENT WILL BE ABLE TO DEMONSTRATE HIS ABILITY TO IDENTIFY THE KIND OF WEATHER A PARTICULAR FORM OF CLOUD GENERALLY PREDICTS.  

CHOOSE THE CORRECT ANSWER.

CIRRUS, MEANING *CURL*, CLOUDS USUALLY INDICATE
A. FAIR WEATHER.
B. DRIZZLY WEATHER.
C. STORMY WEATHER.

STRATUS, MEANING *LAYER* OR *A SPREADING OUT*, CLOUDS GENERALLY PREDICT
A. THUNDERSTORMS.
B. FAIR WEATHER.
C. LONG DRIZZLY RAIN.

CUMULONIMBUS CLOUDS ARE USUALLY ASSOCIATED WITH
A. VERY FAIR WEATHER.
B. SHOWERS.
C. THUNDERSTORMS.

THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE OF A WARM FRONT BY SELECTING THE EFFECT OF A WARM FRONT ON OTHER AIR MASSES.  

CHOOSE THE CORRECT ANSWER.

A WARM FRONT IS WHERE A
A. WARM AIR MASS MEETS A COLD AIR MASS.
B. COLD AIR MASS MOVES UNDER A WARM AIR MASS.
C. COLD AIR MASS MEETS A WARM AIR MASS.

WHEN A LARGE MASS OF WARM AIR MEETS A COLD MASS
A. THE COLD AIR WILL RISE SLOWLY.
B. THE WARM AIR WILL SLOWLY MOVE OVER THE COLD MASS.
C. THE WARM AIR WILL RISE QUICKLY.

AN EXAMPLE OF A WARM AIR FRONT APPROACHING A COLD FRONT WOULD BE
A. MOUNTAIN WIND MOVING DOWN INTO A VALLEY.
B. OCEAN BREEZE MOVING OVER A MOUNTAIN.
C. SEA BREEZE MOVING OVER A BEACH.

BECAUSE A WARM MASS OF AIR HAS LESS DENSITY AND THEREFORE LESS FORCE, IT WILL MOVE SLOWLY OVER A COLD AIR MASS AND THEREFORE BRING A
A. DRY DAY.
B. A DAY OF LIGHT SHOWERS.
C. A DAY OF HEAVY RAINS.
THE STUDENT CAN APPLY HIS KNOWLEDGE OF THE MECHANICAL ADVANTAGE OF A LEVER BY SOLVING PROBLEMS RELATING TO MECHANICAL ADVANTAGE AND LENGTH OF LEVER ARMS.

CHOOSE THE CORRECT ANSWER.

WHAT IS THE MECHANICAL ADVANTAGE WHEN A 120 POUND WEIGHT IS RAISED BY A LEVER 6 FEET LONG WITH FULCRUM PLACED 2 FEET FROM THE LOAD?

A. ONE
B. TWO
*C. THREE
D. FOUR

TO SECURE A MECHANICAL ADVANTAGE OF FOUR, WE MUST HAVE THE FOLLOWING:

A. LEVER 15 FEET LONG WITH THE FULCRUM 3 FEET FROM THE LOAD.
B. HEAVY LOAD WITH A LEVER AT LEAST 12 FEET LONG.
C. LEVER 10 FEET LONG WITH THE FULCRUM 2 FEET FROM THE LOAD.
D. LEVER 15 FEET LONG WITH A FULCRUM 12 FEET FROM THE LOAD.

THE STUDENT CAN APPLY KNOWLEDGE OF THE RELATIONSHIP OF THE TERMS WORK, FORCE AND DISTANCE BY SOLVING PROBLEMS TO DETERMINE THE AMOUNT OF WORK ACCOMPLISHED, THE DISTANCE OVER WHICH THE WORK WAS ACCOMPLISHED OR THE FORCE INVOLVED.

CHOOSE THE CORRECT ANSWER.

DURING THE BUILDING OF THE NEW SCHOOL A CRANE EASILY DID 2000 FOOT POUNDS OF WORK. THIS MEANS THAT THE CRANE WAS ABLE TO MOVE:

A. 200 POUNDS EASILY
*B. 200 POUNDS 10 FEET
C. 2000 POUNDS 10 FEET
D. 200 POUNDS 1 FOOT

JIM AND JERRY IN PLACING A 50 POUND FLOWER POT ON THE PORCH, DID 250 FOOT POUNDS OF WORK. HOW HIGH WAS THE PORCH?

A. 10 FEET
B. 4 FEET
C. 6 FEET
*D. 5 FEET

A WEIGHT LIFTER DID 2160 FOOT-POUNDS OF WORK IN LIFTING A SINGLE WEIGHT. HOW MUCH DID THE WEIGHT LIFTER LIFT?

A. 300 POUNDS
B. 500 POUNDS
C. 250 POUNDS
*D. INSUFFICIENT INFORMATION

THE STUDENT CAN ANALYZE THE RELATIONSHIP BETWEEN THE LEVER AND
THE SINGLE PULLEY BY IDENTIFYING COMMON ELEMENTS.

CHOOSE THE CORRECT ANSWER.

THE MECHANICAL ADVANTAGE GAINED BY USING A SINGLE PULLEY IS

A. TWO.
B. ZERO.
C. FOUR.
D. THREE.

SINGLE PULLEY

A

S

C

8
BY EXERTING AN EFFORT ON *C* SHOWN IN THE DIAGRAM WE ARE ACTUALLY
* A. CHANGING THE POSITION OF *A*, IN RELATION TO THE LOAD.
* B. INCREASING THE EFFORT REQUIRED TO LIFT THE LOAD.
* C. REDUCING THE EFFORT REQUIRED TO LIFT THE LOAD.
* D. GAINING A MECHANICAL ADVANTAGE TO DO WORK.

THE EFFORT REQUIRED TO LIFT *B* MUST BE EQUAL TO *B* BECAUSE
* A. THERE IS NO MECHANICAL ADVANTAGE.
* B. THE PULLEY IS STATIONARY.
* C. THE MECHANICAL ADVANTAGE IS TWO.
* D. THE DISTANCE BETWEEN *B* AND *C* IS EQUAL.

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ELECTRICITY

THE STUDENT WILL SHOW KNOWLEDGE OF CIRCUITS BY SELECTING THE
PURPOSE FOR WHICH A FUSE WAS NOT INTENDED. %3n

CHOOSE THE CORRECT ANSWER.

WHICH OF THE FOLLOWING IS *NOT* TRUE ABOUT A FUSE?
* A. IT CAUSES SHORT CIRCUITS.
* B. IT BREAKS THE CIRCUIT.
* C. IT IS PART OF THE WIRING IN BUILDINGS.
* D. IT HELPS TO PREVENT FIRES.

A FUSE HAS A WIRE IN IT WHICH
* A. CANNOT MELT.
* B. MELTS AT A VERY HIGH TEMPERATURE.
* C. MELTS AT A VERY LOW TEMPERATURE.
* D. IS VERY BRITTLE.

WHEN A FUSE BURNS OUT YOU SHOULD
* A. PUT IN A BIGGER FUSE.
* B. PUT A PENNY IN THE FUSE BOX.
* C. GET A LIGHT RULE WITH MORE VOLTAGE.
* D. FIND OUT WHAT CAUSED THE FUSE TO BURN OUT.

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THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF ELECTRICAL
INSULATION BY IDENTIFYING CONDUCTORS FROM NON-CONDUCTORS. %2n

CHOOSE THE CORRECT ANSWER.

ANYTHING THROUGH WHICH ELECTRONS WILL FLOW IS CALLED A
* A. CONDUCTOR.
* B. NONCONDUCTOR.
* C. VOLT.
* D. INSULATOR.

ALL OF THE FOLLOWING ARE CONDUCTORS OF ELECTRICITY *EXCEPT*
* A. IRON.
* B. SILVER.
* C. COPPER.
* D. TIN.
THE STUDENT WILL DEMONSTRATE A KNOWLEDGE OF ELECTROMAGNETS BY IDENTIFYING ITS PROPERTIES.  

CHOOSE THE CORRECT ANSWER.

ALL OF THE FOLLOWING STATEMENTS ABOUT AN ELECTROMAGNET ARE TRUE *EXCEPT*

A. Its strength can be increased by increasing the number of coil turns.
B. The coiled wire is a magnet as long as electricity is flowing.
C. Its strength can be increased by adding more volts to the circuit.
D. It can be used in generators.

THE STUDENT WILL SHOW AN UNDERSTANDING OF DIFFERENT TYPES OF CIRCUITS BY IDENTIFYING THE CHARACTERISTICS OF PARALLEL AND SERIES CIRCUITS.  

CHOOSE THE CORRECT ANSWER.

TWO LIGHT BULBS ARE CONNECTED IN A CIRCUIT USING A 1 1/2 VOLT DRY CELL. EACH BULB RECEIVES 3/4 OF A VOLT. THE LIGHTS ARE CONNECTED

* A. IN SERIES.
B. IN PARALLEL.
C. INCORRECTLY.
D. TO A SWITCH.

ALL OF THE FOLLOWING ARE EXAMPLES OF PARALLEL WIRING *EXCEPT*

A. Each of three bulbs is as bright as when there was one bulb.
B. Our homes are wired in this way.
C. Each bulb has its own path to and from the dry cell.
D. Electricity must flow through all of the bulbs in the circuit.

ALL OF THE LIGHTS ON YOUR CHRISTMAS TREE GO OUT WHEN ONE BULB BURNS OUT. WHAT KIND OF WIRING MUST THEY HAVE?

A. TUNGSTEN
B. PARALLEL
C. FILAMENT
D. SERIES

TWO DRY CELLS ARE CONNECTED IN PARALLEL. DESCRIBE THE LIGHT WITH TWO DRY CELLS AS COMPARED TO THE LIGHT WITH ONE DRY CELL. THE LIGHT WITH TWO CELLS

A. GETS BRIGHTER.
B. IS THE SAME BRIGHTNESS.
C. GETS DIMMER.
D. GOES OUT.

A CONNECTION IS BETTER WHEN CELLS ARE TO BE USED OVER A LONG PERIOD OF TIME.
A. CIRCUIT
B. PARALLEL
C. SERIES
D. COMPLETE

THE STUDENT WILL BE ABLE TO DIFFERENTIATE BETWEEN CURRENT AND STATIC ELECTRICITY BY MARKING GIVEN EXAMPLES CORRECTLY. %50

DIRECTIONS - DECIDE IF EACH EXAMPLE IS CAUSED BY CURRENT OR STATIC ELECTRICITY. CHOOSE *A* FOR CURRENT ELECTRICITY AND CHOOSE *R* IF IT IS AN EXAMPLE OF STATIC ELECTRICITY.

LIGHTNING *R
BURNING LIGHT BULB *A
A HOT IRON *A
SHOCK WHEN YOU SLIDE OUT OF A CAR *R
SHOCK WHEN YOU TOUCH A DOOR KNOB *R

THE STUDENT WILL SHOW HIS UNDERSTANDING OF A COMPLETE CIRCUIT BY SELECTING THE CORRECT LIST OF COMPONENTS NEEDED IN A GIVEN SITUATION. %30

DIRECTIONS - READ EACH PROBLEM AND DECIDE WHAT EQUIPMENT WILL BE NEEDED TO MAKE THE ITEM WORKABLE.

MAKE A LIGHT BULB BURN.
A. WIRE, BULB, SOCKET FOR BULB
B. WIRE, BULB, BATTERY
C. BULB, BATTERY, SOCKET FOR BULB
D. BULB, SWITCH, BATTERY

MAKE A DOORBELL RING WHEN SOMEONE PUSHES THE BUTTON.
A. DOORBELL, BATTERY, WIRE, FEEDBACK CONTROL
B. BATTERY, WIRE, SWITCH, FUSE
C. THERMOSTAT, WIRE, FUSE, DOORBELL
D. BATTERY, WIRE, SWITCH, DOORBELL

MAKE AN ELECTROMAGNET.
A. PERMANENT MAGNET, BATTERY, TACKS
B. WIRE, BATTERY, NAIL
C. WIRE, NAIL, BOLT
D. BOLT, PERMANENT MAGNET, BATTERY

THE STUDENT WILL APPLY HIS KNOWLEDGE OF BATTERIES TO DECIDE WHICH TYPE OF BATTERY IS BEST SUITED FOR GIVEN USE. %60

READ THE ITEM BELOW AND CHOOSE THE LETTER CORRESPONDING TO THE TYPE OF BATTERY THAT WOULD BE BEST.
A. DRY CELLS
B. STORAGE BATTERY
C. SOLAR BATTERY

A BATTERY FOR A SATLLITE *C
A BATTERY FOR A CAR *B
A BATTERY FOR A CLOCK *A
A BATTERY FOR A RADIO *A
A BATTERY FOR A SMALL PLANE *B
A BATTERY FOR A FLASH CAMERA *A

THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE OF ELECTRICAL CIRCUITRY BY SELECTING THE ILLUSTRATION WHICH BEST SHOWS THE STATED CIRCUIT.

(REFER TO DIAGRAMS ON PAGE 88A FOR ITEMS 1156 - 1159 (PAGE 89))
CHOOSE THE LETTER OF THE PICTURE THAT *BEST* SHOWS THE TYPE OF CIRCUIT GIVEN:

- SHORT CIRCUIT *C*  
- COMPLETE CIRCUIT *B*  
- A COMPLETE CIRCUIT *A*  
- AN INCOMPLETE CIRCUIT *B*

THE STUDENT WILL ANALYZE THE RELATIONSHIP BETWEEN CONDUCTORS IN A CHART AND SELECT THE MOST APPROPRIATE MATERIAL THAT COULD BE OR WAS USED IN A SPECIFIC SITUATION.*%*%

THE FOLLOWING CHART IS IN A LOGICAL ORDER. DETERMINE THE ORDER AND THEN SELECT THE CORRECT MATERIAL FOR THE FOLLOWING SITUATIONS.*%*%*

1. SILVER  
2. COPPER  
3. ALUMINUM  
4. IRON  
5. GLASS  
6. WATER  
7. WOOD  
8. ASBESTOS  
9. GLASS WOOL  
10. COTTON  
11. ROCK WOOL  
12. AIR

THE ORDER OF THIS LIST IS DETERMINED BY THE MATERIAL'S ABILITY TO

A. ABSORB HEAT.  
B. PRODUCE HEAT.  
C. RETAIN HEAT.  
D. CONDUCT HEAT.*%*%

THE LIST IS ORDERED FROM

A. BETTER TO POORER.  
B. POORER TO BETTER.  
C. EXPENSIVE TO INEXPENSIVE.  
D. INSULATORS TO CONDUCTORS.*%*%

IF YOU WERE HOLDING A HANDLE ON A PAN ON A STOVE, WHICH OF THE FOLLOWING WOULD YOU LIKE THE HANDLE TO BE MADE OF?

A. IRON  
B. COPPER  
C. WOOD  
D. ALUMINUM

WHICH OF THE FOLLOWING WOULD BE THE *BEST* MATERIAL TO LINE THE BOTTOM OF COOKING PANS?

A. COPPER  
B. ALUMINUM  
C. GLASS  
D. IRON
THERMAL WINDOWS ARE TWO PIECES OF GLASS WITH AIR CAUGHT BETWEEN THEM. IN THE WINTER THESE WINDOWS WOULD
A. KEEP THE HEAT OUT.
B. KEEP THE HEAT IN.
C. BE STRONGER.
D. BE CLEANER.

A BUILDER WISHES TO KEEP A HOUSE COOL IN THE SUMMER AND WARM IN THE WINTER, SO HE WILL PUT A LINING BETWEEN THE WALLS OF THE HOUSE. THE BEST MATERIAL HE COULD USE WOULD BE
A. ALUMINUM.
B. WOOD.
C. ROCK WOOL.
D. ASBESTOS.

3 FRYING PANS OF CHICKEN WERE ON THE STOVE ALL COOKING OVER A MEDIUM FLAME. AFTER 10 MINUTES 2 OF THE PANS OF CHICKEN BEGAN TO BURN. THE CHICKEN THAT DIDN'T BURN PROBABLY WAS COOKED IN A PAN LINED WITH
A. IRON.
B. GLASS.
C. ALUMINUM.
D. COPPER.

THE CHICKEN THAT WAS BURNED THE MOST WAS PROBABLY COOKED IN A PAN LINED WITH
A. IRON.
B. SILVER.
C. ALUMINUM.
D. COPPER.

THE STUDENT WILL REALIZE THE IMPORTANCE OF ELECTRICITY BY IDENTIFYING FROM A GIVEN SITUATION THOSE THINGS WHICH COULD NOT TAKE PLACE WITHOUT ELECTRICITY. IN THE STORY BELOW READ EACH SENTENCE CAREFULLY. DECIDE IF EVERYTHING THAT HAPPENS IN THAT SENTENCE COULD TAKE PLACE WITHOUT ANY KIND OF ELECTRICITY. THEN SELECT THE ANSWER THAT LISTS ALL OF THE SENTENCES THAT COULD NOT HAPPEN.

MARTHA AWAKENED TO HER CLOCK-RADIO ALARM. 2. SHE GOT READY FOR WORK. 3. SHE WAS LATE AS USUAL SO SHE JUST PUT A PIECE OF BREAD IN THE TOASTER FOR BREAKFAST. 4. AFTER EATING BREAKFAST SHE HURRIED TO HER CAR AND DROVE TO WORK.
A. 1,3
B. 2,3,4
C. 1,3,4
D. 1,2,3

JIM CAME HOME FROM SCHOOL. 6. HE WENT TO THE REFRIGERATOR AND TOOK OUT AN ICE CREAM BAR. 7. THEN HE TURNED ON HIS RECORD PLAYER AND LISTENED TO IT AS HE PLAYED WITH SOME TOYS. 8. HE FINALLY PUT HIS TOYS AWAY WHEN HIS MOTHER CALLED HIM TO SUPPER.
A. 5,6,7,8
B. 6,7
C. 5,6,7
D. 7,8
PLANETS AND SPACE TRAVEL

THE STUDENT WILL DEMONSTRATE A KNOWLEDGE OF THE PLANETS BY SELECTING FACTS CONCERNING INDIVIDUAL PLANETS. 

CHOOSE THE CORRECT ANSWER.

THE PLANET CLOSEST TO THE SUN IS

A. VENUS. 2400149
B. PLUTO. 2400149
C. EARTH. 2400149
D. JUPITER. 2400149
*E. MERCURY. 2400149

THE EARTH IS THE LARGEST PLANET.

A. SECOND 2400150
B. THIRD 2400150
*C. FIFTH 2400150
D. SEVENTH 2400150

THE SMALLEST PLANET IS

A. URANUS. 2400151
B. JUPITER. 2400151
C. NEPTUNE. 2400151
*D. MERCURY. 2400151

THE EARTH REVOLVES AROUND

A. VENUS. 2400152
B. THE MOON. 2400152
*C. THE SUN. 2400152
D. ORBITS. 2400152

THE PLANET WHICH SOMETIMES LOOKS LIKE A MOON TO US WHEN VIEWED THROUGH A TELESCOPE IS

*A. VENUS. 2400153
B. SATURN. 2400153
C. JUPITER. 2400153
D. URANUS. 2400153

EXCEPT FOR THE MOON, THE BRIGHTEST LIGHT IN THE NIGHT SKY IS

A. THE SUN. 2400154
*B. VENUS. 2400154
C. SATURN. 2400154
D. JUPITER. 2400154

THE PLANET THAT IS RINGED BY THREE WIDE BANDS IS

*A. SATURN. 2400155
B. JUPITER. 2400155
C. NEPTUNE. 2400155
D. MARS. 2400155

THE LARGEST PLANET IS

A. EARTH. 2400156
*B. JUPITER. 2400156
C. SATURN. 2400156
D. MERCURY.

IT TAKES EARTH APPROXIMATELY **DAYS TO ORBIT THE SUN**.

1. 365
2. 1
3. 52
4. 7
5. 200

THE PLANET MOST LIKE THE EARTH IS

1. PLUTO
2. SATURN
3. VENUS
4. MARS

ALTOGETHER, JUPITER HAS **SATELLITES**.

1. TWO
2. FOUR
3. TWELVE
4. SIXTEEN

WHICH PLANET HAS NO SATELLITES?

1. MERCURY
2. EARTH
3. JUPITER
4. NEPTUNE
5. MARS

THE STUDENT WILL DEMONSTRATE HIS KNOWLEDGE OF THE DIFFERENT SHAPES OF GALAXIES, SUCH AS IRREGULAR, ELLIPTICAL, AND SPIRAL, BY SELECTING THE SHAPE FOR GIVEN GALAXIES.

**CHOOSE THE CORRECT SHAPE FOR EACH GALAXY LISTED.**

THE MILKY WAY GALAXY IS CLASSIFIED AS WHAT SHAPE?

1. IRREGULAR
2. ELLIPTICAL
3. SPIRAL

THE ANDROMEDA GALAXY IS CLASSIFIED AS WHAT SHAPE?

1. IRREGULAR
2. ELLIPTICAL
3. SPIRAL

THE HORSE SHOE NEBULA IS CLASSIFIED AS WHAT SHAPE?

1. IRREGULAR
2. ELLIPTICAL
3. SPIRAL

THE STUDENT CAN DEMONSTRATE HIS KNOWLEDGE OF CONSTELLATIONS BY COMPARING AND IDENTIFYING SPECIFIC STAR GROUPS ON A STANDARDIZED CONSTELLATION MAP.
Rigel is found in what constellation group?  
A. Orion  
B. Ursa Minor  
C. Cassiopeia  
D. Lyra  

Vega is found in what constellation group?  
A. Ursa Major  
B. Ursa Minor  
C. Cassiopeia  
D. Lyra  

Betelgeuse is found in what constellation group?  
A. Ursa Major  
B. Ursa Minor  
C. Orion  
D. Cassiopeia  

Polaris is found in what constellation group?  
A. Ursa Major  
B. Ursa Minor  
C. Cassiopeia  
D. Ursa Minor  

Castor is found in what constellation group?  
A. Ursa Major  
B. Ursa Minor  
C. Orion  
D. Cassiopeia  
E. Gemini  

Regulus is found in what constellation group?  
A. Ursa Major  
B. Ursa Minor  
C. Cassiopeia  
D. Leo  
E. Orion  
F. Gemini  

Surus is found in what constellation group?  
A. Ursa Major  
B. Ursa Minor  
C. Leo  
D. Canis Major  
E. Canis Minor  

Pollux is found in what constellation group?  
A. Ursa Major  
B. Ursa Minor  
C. Cassiopeia  
D. Gemini  
E. Orion  

*******************************************************************************
The student can locate and compare the basic characteristics of planets by using a standardized diagram of the solar system.

Using the above chart, locate and compare the following planets in their orbital revolution around the sun.

The inner planets revolving around the sun are
A. Saturn, Neptune, Pluto
B. Earth, Mars, Jupiter
C. Jupiter, Saturn, Neptune
*D. Mercury, Venus, Mars, Earth

The outer planets revolving around the sun are
A. Saturn, Neptune, Pluto, Earth, Mercury
B. Earth, Mars, Neptune
*C. Jupiter, Saturn, Uranus, Neptune, Pluto
D. Saturn, Uranus, Neptune, Mars
E. Mercury, Venus, Mars, Earth

The planet closest to the sun is
A. Venus
*B. Mercury
C. Earth
D. Jupiter

The planet revolving in the third orbital plane around the sun is
A. Mars
B. Venus
*C. Mercury
*D. Earth

Planetoids are found between the orbital planes of
A. Mercury and Venus
B. Venus and Earth
C. Earth and Mars
*D. Mars and Jupiter

The planets which have no known satellites are
A. Uranus and Earth
B. Mercury and Mars
C. Jupiter and Saturn
*D. Mercury, Venus and Pluto

The planet which apparently has the greatest number of satellites is
A. Saturn
*B. Jupiter
C. Uranus
D. Neptune

The satellites which has three rings rotating around its planet is
A. Neptune
B. Jupiter
*C. Saturn
*D. Mars

Which planet has the shortest revolution around the sun
*A. Mercury
B. Venus
C. EARTH
D. MARS

WHICH PLANET TAKES 365 DAYS TO REVOLVE AROUND THE SUN?
A. VENUS
*B. EARTH
C. MARS
D. JUPITER

THE PLANET WITH THE SLOWEST ROTATIONAL SPEED AS IT REVOLVES AROUND THE SUN IS
*A. MERCURY
B. VENUS
C. EARTH
D. MARS

WHICH PLANET IS CONSIDERED THE LARGEST IN SIZE?
A. MARS
B. SATURN
*C. JUPITER
D. URANUS

WHICH PLANETS APPARENTLY HAVE ONLY TWO SATELLITES?
A. EARTH, MARS
B. NEPTUNE, PLUTO
*C. MARS, PLUTO
D. MARS, NEPTUNE

WHICH PLANET IS THE FARTHEST DISTANCE FROM THE SUN?
A. SATURN
B. URANUS
C. NEPTUNE
*D. PLUTO

WHICH PLANET IS CALLED THE SISTER PLANET OF EARTH?
A. MERCURY
B. VENUS
*C. MARS
D. JUPITER

THE CHILD WILL KNOW THE MEANING OF ASTEROID BY SELECTING THE BEST DEFINITION FOR IT.

OF THE FOLLOWING, THE ONE WHICH BEST DEFINES ASTEROID IS
*A. SMALL PLANET
B. SMALL ASTERS
C. SMALL METEORS
D. SMALL STARS

THE CHILD WILL KNOW THE MEANING OF ESCAPE VELOCITY, BY SELECTING ITS DEFINITION.

CHOOSE THE CORRECT ANSWER.
WHICH OF THE FOLLOWING BEST DEFINES ESCAPE VELOCITY?

* A. THE VELOCITY NEEDED FOR A SHIP TO LEAVE EARTH'S GRAVITATIONAL PULL.
 B. THE VELOCITY NEEDED TO GET OFF THE GROUND.
 C. THE VELOCITY NEEDED TO LEAVE SHIP WHILE ON SPACE.
 D. NONE OF ABOVE

THE CHILD WILL KNOW THE MEANINGS OF ROTATION AND REVOLUTION BY SELECTING THE BEST DEFINITIONS FOR THEM. *2

CHOOSE THE CORRECT ANSWER.

THE TERM WHICH CORRECTLY DEFINES ROTATION IS

* A. SPINNING OF A BODY, AROUND AN IMAGINARY LINE DRAWN THROUGH ITS CENTER.
 B. SPINNING OF A BODY IN TWO DIRECTIONS.
 C. MOVING AROUND THE SUN IN A DEFINITE PATH.
 D. MOVING AROUND THE MOON IN A DEFINITE PATH.

THE TERM WHICH CORRECTLY DEFINES REVOLUTION IS

* A. THE MOTION OF ONE BODY IN SPACE AROUND ANOTHER.
 B. MOVING OF A BODY THROUGH SPACE.
 C. SPINNING OF A BODY ON AN AXIS.
 D. FALLING OF A BODY OFF ITS AXIS.

GIVEN THE DEFINITION OF ROTATION AND REVOLUTION, THE CHILD CAN APPLY THIS INFORMATION BY PICKING OUT THE EFFECTS OF EACH ON THE EARTH. *2

CHOOSE THE CORRECT ANSWER.

ONE OF THE EFFECTS OF ROTATION ON THE EARTH IS

A. SEASONS.
* B. NIGHT AND DAY.
 C. YEAR.
 D. NONE OF ABOVE.

ONE OF THE DIRECT EFFECTS OF REVOLUTION IS

A. RAINFALL.
* B. SEASONS.
 C. NIGHT AND DAY.
 D. NONE OF ABOVE.

AFTER HAVING STUDIED THE PLANETS AND THEIR RELATIONSHIP TO THE SUN, THE CHILD CAN APPLY THIS KNOWLEDGE BY SELECTING FROM A GROUP OF STATEMENTS THE CORRECT EFFECT THE SUN HAS ON VARIOUS PLANETS. *2

CHOOSE THE CORRECT ANSWER.

BECAUSE OF ITS POSITION IN RELATION TO THE SUN, MERCURY WOULD
PROBABLY
A. MOVE VERY SLOWLY AROUND THE SUN.
B. HAVE SHORTER DAYS AND NIGHTS THAN ON EARTH.
C. BE EXTREMELY HOT WHEN FACING THE SUN.
D. NONE OF THE ABOVE.

BECAUSE OF ITS POSITION IN RELATION TO THE SUN, PLUTO WOULD
PROBABLY
A. SUPPORT LIFE.
B. BE TOO COLD TO SUPPORT LIFE AS WE KNOW IT.
C. move IN A CIRCULAR PATH AROUND THE SUN.
D. NONE OF THE ABOVE.

THE STUDENT CAN APPLY HIS KNOWLEDGE OF CONDITIONS ON
THE EARTH BY ESTIMATING CONDITIONS WHICH WOULD EXIST ON A
HYPOTHETICAL PLANET.

A HYPOTHETICAL PLANET *SPAR* IS THE NEWEST MEMBER OF
OUR SOLAR SYSTEM. SPAR IS 6,000 MILES IN DIAMETER AND ITS ORBIT
VARIES FROM 98 MILLION TO 108 MILLION MILES FROM THE SUN. SPAR
ROTATES ON A PERPENDICULAR AXIS EVERY 22 1/2 HOURS. ITS PERIOD
OF REVOLUTION ABOUT THE SUN IS 391 DAYS.

BASED ON WHAT YOU KNOW ABOUT THE EARTH SELECT THE ANSWER
WHICH WOULD BEST DESCRIBE CONDITIONS ON SPAR.

'HOW MUCH DAYLIGHT WOULD THERE BE, AT MOST POINTS, DURING A FULL
DAY ON SPARO
A. 15 HOURS
B. 8 HOURS
C. 14 HOURS
D. 11 1/4 HOURS

WHAT WOULD A 100 POUND EARTH BOY WEIGH ON SPARO
A. APPROXIMATELY 100 POUNDS
B. APPROXIMATELY 16 POUNDS
C. APPROXIMATELY 120 POUNDS
D. APPROXIMATELY 65 POUNDS

SUNLIGHT WOULD SHINE ON THE NORTH POLE OF SPAR
A. ABOUT 1/2 OF ITS YEAR.
B. INFREQUENTLY IF EVER DURING THE YEAR.
C. 22 1/2 HOURS PER DAY - YEAR ROUND.
D. DURING THE SUMMER ONLY.

TEMPERATURE CONDITIONS ON SPAR WOULD
A. BE RELATIVELY CONSTANT IN A GIVEN REGION.
B. CHANGE DRAMATICALLY WITHIN A REGION.
C. VARY FROM SEASON TO SEASON.
D. WOULD BE MUCH COLDER IN WINTER THAN IT IS ON THE EARTH.

THE STUDENT CAN RECALL THE DEFINITION OF THE SOLAR SYSTEM BY
SELECTING ITS BEST DESCRIPTION.

CHOOSE THE CORRECT ANSWER.
THE SOLAR SYSTEM INCLUDES
A. THE PLANETS, THE SUN AND GRAVITY
*B. THE SUN, THE PLANETS AND THE PLANETS MOONS
C. THE UNIVERSE, THE SUN AND THE PLANETS

THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF THE MOON IN RELATION TO THE EARTH BY IDENTIFYING STATEMENTS WHICH GIVE THE RELATIVE POSITION OF THE MOON TO THE EARTH AT CERTAIN TIMES AND THE EFFECTS OF THE MOTION OF THE MOON AROUND THE EARTH.

CHOOSE THE CORRECT ANSWER.

THE MOTION OF THE MOON AROUND THE EARTH EXPLAINS ALL OF THE FOLLOWING, EXCEPT -
A. THE PHASES OF THE MOON.
*B. THE CHANGE OF CONSTELLATIONS THAT WE SEE.
C. ECLIPSES.
D. SHIFTING OF THE TIDES.

WE ON EARTH SEE A FULL MOON WHEN
A. THE MOON IS BETWEEN THE EARTH AND THE SUN.
B. THE SUN IS BETWEEN THE EARTH AND THE MOON.
*C. THE EARTH IS BETWEEN THE MOON AND THE SUN.

THE DARK SIDE OF THE MOON FACES THE EARTH WHEN
*C. THE MOON IS BETWEEN THE EARTH AND THE SUN.
B. THE SUN IS BETWEEN THE EARTH AND THE MOON.
A. THE EARTH IS BETWEEN THE MOON AND THE SUN.

WHICH OF THE FOLLOWING IS TRUE
A. THE MOON REVOLVES AROUND THE SUN.
B. THE MOON CHANGES ITS SHAPE.
C. HOT GASES ON THE MOON GIVE OFF LIGHT.
*D. THE SAME SIDE OF THE MOON ALWAYS FACES THE EARTH.

THE STUDENT WILL DEMONSTRATE A KNOWLEDGE OF THE MOON BY SELECTING FACTS ABOUT ITS SIZE, REVOLUTION, AND SURFACE FEATURES.

CHOOSE THE CORRECT ANSWER.

THE MOON REVOLVES AROUND THE EARTH ONCE
*A. EACH 27 DAYS.
B. EACH SEASON.
C. EACH 365 DAYS.
D. A DAY.

THE MOON IS KEPT IN ITS ORBIT BECAUSE
A. IT IS SPINNING AT A HIGH SPEED.
B. IT IS SMALLER THAN THE EARTH.
*C. OF THE EARTH'S GRAVITY.
D. BOTH THE MOON AND EARTH HAVE GRAVITY.

THE EARTH'S NEAREST NEIGHBOR IN SPACE IS
A. VENUS.

THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF THE MOON IN RELATION TO THE EARTH BY IDENTIFYING STATEMENTS WHICH GIVE THE RELATIVE POSITION OF THE MOON TO THE EARTH AT CERTAIN TIMES AND THE EFFECTS OF THE MOTION OF THE MOON AROUND THE EARTH.
MARS
C THE SUN.
D THE MOON.

WHICH OF THE FOLLOWING WAS NOT FOUND ON THE SURFACE OF THE MOON
A. DEEP CRATERS
B. TOWERING MOUNTAIN RANGES
C. DEEP SEAS OF WATER
D. RILLS OR CRACKS

THE MOON'S DIAMETER IS *0 A BIG AS THE EARTH'S DIAMETER.
A. ONE-HALF
B. ONE-FOURTH
C. TWICE
D. FOUR TIMES

THE MOON IS A
A. SATELLITE
B. PLANET
C. STAR
D. LIGHT

TIDES OCCUR BECAUSE OF THE MOON'S
A. GRAVITY
B. LIGHT
C. MOTION
D. PHASES

THE STUDENT WILL DEMONSTRATE KNOWLEDGE OF THE SOLAR SYSTEM BY IDENTIFYING THE NAMES OF PLANETS.

CHOOSE THE CORRECT ANSWER.

OF THE FOLLOWING, THE ONE CHOICE WHICH IS NOT A PLANET IS
A. EARTH
B. PLUTO
C. MARS
D. SUN

OF THE FOLLOWING GROUPS, THE ONE WHICH CONTAINS ONLY PLANETS IS
A. VENUS, MERCURY, KRYPTON
B. EARTH, JUPITER, MOON
C. SATURN, URANUS, NEPTUNE
D. PLUTO, NEPTUNE, SUN

THE STUDENT CAN COMPREHEND THE ARRANGEMENT OF PLANETS IN OUR SOLAR SYSTEM BY SELECTING THE POSITION OF A PARTICULAR PLANET.
THE PLANET BETWEEN SATURN AND NEPTUNE IS
*A. URANUS*
B. PLUTO
C. JUPITER
D. EARTH

THE THIRD PLANET FROM THE SUN IS
A. MARS
B. VENUS
*C. EARTH*
D. JUPITER

THE FURTHEST KNOWN PLANET FROM THE SUN IS
A. SATURN
B. URANUS
C. NEPTUNE
*D. PLUTO*

GIVEN A PARAGRAPH ABOUT A PLANET, THE CHILD CAN ANALYZE IT BY STATING WHETHER LIFE DOES OR DOES NOT EXIST ON THAT PLANET.

CHOOSE THE CORRECT ANSWER.

**MERCURY IS A PLANET WHICH IS VERY CLOSE TO THE SUN. IT REVOLVES AND ROTATES AT THE SAME RATE, SO THAT THE SAME SIDE OF THE PLANET ALWAYS FACES THE SUN. THE TEMPERATURE ON THIS SIDE IS ABOUT 3000 DEGREES F. WHILE ON THE OTHER SIDE IT IS ABOUT -2000 DEGREES F.**

FROM THE PARAGRAPH WE CAN DEDUCE THAT

A. LIFE PROBABLY EXISTS ON MERCURY.
*B. LIFE PROBABLY DOESN'T EXIST ON MERCURY.*
C. NOT ENOUGH INFORMATION TO DECIDE IF LIFE EXISTS.

**SATURN IS THE SIXTH PLANET FROM THE SUN. IT HAS MANY MOONS AROUND IT. SATURN IS THE ONLY PLANET THAT HAS RINGS AROUND IT. SATURN IS THE SECOND LARGEST PLANET IN OUR SOLAR SYSTEM.**

FROM THIS PARAGRAPH WE CAN DEDUCE THAT

A. LIFE PROBABLY EXISTS ON SATURN.
B. LIFE PROBABLY DOESN'T EXIST ON SATURN.
*C. NOT ENOUGH INFORMATION TO DECIDE IF LIFE EXISTS.*
ONLY THEIR NAMES. %20

CHOOSE THE CORRECT ANSWER.

FROM THE FOLLOWING GROUPS, CHOOSE THE ONE GROUP THAT CONTAINS THE NAMES OF *ONLY* THE FIRST ASTRONAUTS.

A. BORMAN, GRISSOM, GLENN, SHEPHARD
B. ARMSTRONG, COOPER, SCHIRRA, ALDRIN
C. LOVETT, ARMSTRONG, GLENN, CARPENTER
*D. GLENN, COOPER, CARPENTER, SCHIRRA

OF THE FOLLOWING ASTRONAUTS, THE ONE WHO *NEVER* FLEW IN A MERCURY SPACE CAPSULE WAS

A. COOPER.
*B. SLAYTON.
C. CARPENTER.
D. SCHIRRA.

THE CHILD CAN COMPREHEND THE DIFFERENCES BETWEEN THE MERCURY AND GEMINI SPACE PROGRAMS BY SELECTING THE MAJOR CHARACTERISTICS OF EACH. %20

CHOOSE THE CORRECT ANSWER. %20

WHICH OF THE FOLLOWING DID *NOT* CHANGE FROM THE MERCURY TO THE GEMINI SPACE PROGRAM?

A. THE NUMBER OF MEN IN THE CAPSULE.
*B. THE BOOSTER ROCKET.
C. THE LENGTH OF TIME IN SPACE.
D. THE ENVIRONMENTAL CONTROL SYSTEM.
*E. THE COMMUNICATION SYSTEM.

WHICH OF THE FOLLOWING DID *NOT* CHANGE FROM THE MERCURY TO THE GEMINI SPACE PROGRAM?

A. HAVING A COMPUTER IN THE SPACE CAPSULE.
B. HAVING THE ABILITY TO CHANGE ORBIT.
*C. EATING THE SAME TYPE FOOD.
D. BEING ABLE TO RENDEZVOUS AND DOCK WITH A TARGET.
E. BEING ABLE TO CONTROL RE-ENTRY INTO ATMOSPHERE.

AFTER STUDYING THE PROBLEMS OF TRAVELING THROUGH SPACE, THE CHILD CAN EVALUATE STATEMENTS ON THE VARIOUS TECHNIQUES OF TRAVELING THROUGH SPACE BY CITING THE MOST PROBABLE JUSTIFICATIONS. %30

READ THE FOLLOWING PARAGRAPH AND THEN ANSWER THE QUESTIONS BELOW. %30

IN 1962, AFTER PRESIDENT KENNEDY’S DECLARATION TO LAND A MAN ON THE MOON AND RETURN HIM SAFELY TO EARTH, THE OPERATIONAL HEADS OF NASA DEVELOPED THREE PLANS TO MEET THIS OBJECTIVE. ONE CALLED FOR A DIRECT ATTEMPT TO LAND ON THE MOON, WHERE ONE SHIP WOULD BLAST OFF FROM THE EARTH, LAND ON THE MOON, AND THEN RETURN TO EARTH. A SECOND PLAN CALLED FOR A SHIP TO BLAST OFF FROM THE EARTH, ORBIT THE EARTH, AND HAVE A SECOND SHIP AS PART OF THE FIRST TO LEAVE EARTH ORBIT, GO TO THE MOON, LAND, AND THEN RETURN TO EARTH LEAVING A SPACE STATION IN EARTH ORBIT. THE THIRD
PLAN CALLED FOR A SHIP TO BLAST OFF FROM EARTH: GO INTO LUNAR ORBIT, HAVE ANOTHER SHIP PART OF THE FIRST UNDOCK, LAND ON THE MOON, RETURN TO THE MOTHER SHIP, AND THEN RETURN TO EARTH.

OF THE FOLLOWING ITEMS, THE ONE WHICH COULD JUSTIFY THE ABANDONMENT OF PLAN ONE WAS
A. THE GRAVITY ON THE MOON.
*B. THE GRAVITY ON THE EARTH.
C. THE LACK OF GRAVITY IN SPACE.
D. NONE OF THE ABOVE.

OF THE FOLLOWING ALTERNATIVES, THE ONE WHICH COULD JUSTIFY THE ABANDONMENT OF PLAN TWO WAS
A. THE POSITION OF THE SPACE STATION IN RELATION TO THE MOON.
B. THE TYPE OF LANDING SYSTEM REQUIRED.
*C. TOO MANY NEW TECHNIQUES TO DEVELOP IN SPACE TRAVEL.
D. NONE OF THE ABOVE.

OF THE FOLLOWING ALTERNATIVES, THE ONE WHICH DID NOT AFFECT THE CHOOSING OF PLAN THREE WAS
A. THE LOW COST OF THE METHOD.
B. THE SPARSENESS OF NEW TECHNIQUES TO BE LEARNED.
*C. THE DISTANCE BETWEEN THE EARTH AND THE MOON.
D. NONE OF THE ABOVE.

GIVEN DEFINITIONS OF CENTRIFUGAL FORCE AND GRAVITY, THE CHILD CAN APPLY THESE DEFINITIONS BY EXPLAINING WHY A SATELLITE REMAINS IN ORBIT. CHOOSE THE CORRECT ANSWER.

OF THE FOLLOWING, THE ONE WHICH BEST EXPLAINS WHY A SATELLITE REMAINS IN ORBIT IS
A. THE FORCE OF GRAVITY AND THE CENTRIPETAL FORCE BALANCE EACH OTHER WITH THE OBJECT REMAINING IN ORBIT AS A RESULT OF THIS.
*B. CENTRIFUGAL FORCE FORCES AN OBJECT OUT AND GRAVITY FORCES IT DOWN. REPEATING THIS OVER AND OVER AGAIN KEEPS THE OBJECT IN ORBIT AROUND A BODY.
C. BOTH FORCES, CENTRIFUGAL AND GRAVITATIONAL PRODUCE CIRCULAR MOTION WHICH KEEPS AN OBJECT IN ORBIT AROUND A BODY.

MECHANICS AND HEAT

THE STUDENT WILL RECALL THE DEFINITION OF GRAVITY BY SELECTING IT FROM A LIST. CHOOSE THE CORRECT ANSWER.
THE STUDENT CAN APPLY THE CONCEPT THAT PITCH DEPENDS ON SPEED OF VIBRATION - THE FASTER THE VIBRATIONS, THE HIGHER THE PITCH. TO SITUATIONS INVOLVING THE VIBRATIONS THROUGH CERTAIN MEDIUMS.

CHOOSE THE CORRECT ANSWER.

THE THICKEST STRING ON A GUITAR PLAYS
*A. THE LOWEST PITCH BECAUSE A THICK STRING VIBRATES MORE SLOWLY.*
*B. THE LOWEST PITCH BECAUSE A THICK STRING VIBRATES QUICKLY.*
*C. THE HIGHEST PITCH BECAUSE A THICK STRING VIBRATES MORE SLOWLY.*
*D. THE HIGHEST PITCH BECAUSE A THICK STRING VIBRATES FASTER.*

WHEN YOU HUM A HIGH NOTE, YOUR VOCAL CHORDS ARE VIBRATING *....*

THAN WHEN YOU HUM A LOW NOTE.
*A. FASTER*
*B. SLOWER*
*C. LONGER*
*D. HARDER*

IF YOU STRIKE FIRST A QUART MILK BOTTLE AND THEN A PINT MILK BOTTLE WITH A STICK, WHAT HAPPENS?
*A. THE PINT BOTTLE MAKES A HIGHER PITCH.*
*B. THE PINT BOTTLE MAKES A LOWER PITCH.*
*C. THE QUART BOTTLE MAKES A HIGHER PITCH.*
*D. BOTH BOTTLES MAKE THE SAME PITCH.*

A VIOLINIST PLAYS A NOTE. IT IS NOT THE CORRECT PITCH SO HE IS OUT OF TUNE. HE TIGHTENS THE STRING. NOW THE PITCH IS
*A. HIGHER*
*B. LOWER*
*C. THE SAME*
*D. RIGHT*

WHICH OF THESE DOES *NOT* AFFECT PITCH?
*A. LENGTH*
*B. LOUDNESS*
*C. TENSION*
*D. THICKNESS*

IN A MERCURY THERMOMETER THE MERCURY RISES WHEN THE TEMPERATURE RISES BECAUSE THE MOLECULES OF MERCURY HAVE *A. SPREAD OUT.*
*B. INCREASED IN NUMBER.*
*C. EXPANDED.*
A STEEL BRIDGE HAS EXPANSION JOINTS
A. TO MAKE THE BRIDGE PRETTIER.
B. BECAUSE THE LENGTH OF THE BRIDGE CHANGES.
C. TO MAKE THE BRIDGE EASIER TO RAISE.
D. TO PREVENT TRAFFIC JAMS WHEN THERE IS A LOT OF TRAFFIC.

WHEN IS AN ASPHALT ROAD MOST LIKELY TO BUCKLE?
A. IN THE WINTER
B. IN THE SUMMER
C. AT NIGHT
D. DURING RUSH HOUR

A STEEL BALL CAN BE PASSED VERY EASILY THROUGH A STEEL RING.
THE BALL IS PLACED IN A FLAME AND HEATED. NOW THE BALL CANNOT BE PASSED THROUGH THE RING. WHAT HAS HAPPENED?
A. THE MOLECULES IN THE BALL MOVED FASTER CAUSING THE BALL TO CONTRACT.
B. THE MOLECULES IN THE BALL OCCUPY A LARGER SPACE THAN THEY DID BEFORE CAUSING THE BALL TO EXPAND.
C. THE MOLECULES IN THE BALL GOT BIGGER CAUSING THE BALL TO EXPAND.
D. THE HEAT PRODUCED MORE MOLECULES CAUSING THE BALL TO EXPAND.

IF THE BALL IS COOLED, IT
A. COULD FREEZE BECAUSE ITS MOLECULES WOULD CONTRACT.
B. COULD PASS THROUGH THE RING BECAUSE ITS MOLECULES HAVE GONE BACK TO OCCUPYING THEIR ORIGINAL SPACE.
C. STILL COULDN'T PASS THROUGH THE RING BECAUSE THE MOLECULES HAVE GOTTEN TOO LARGE.
D. WOULD LOSE SOME OF ITS MOLECULES MAKING IT SMALL ENOUGH TO PASS THROUGH THE RING.

SUPPOSE THAT BOTH THE STEEL BALL AND THE STEEL RING WERE HEATED AT THE SAME TIME. WHAT WOULD HAPPEN?
A. THE BALL COULDN'T PASS THROUGH THE RING BECAUSE THE BALL IS SOLID AND HAS MORE MOLECULES.
B. THE BALL COULDN'T PASS THROUGH THE RING BECAUSE THE RING HAS MORE SPACE IN WHICH TO EXPAND.
C. THE BALL COULDN'T PASS THROUGH THE RING BECAUSE BOTH WOULD CONTRACT.
D. THE BALL COULDN'T PASS THROUGH THE RING BECAUSE BOTH WOULD EXPAND.

A BALLOON FILLED WITH AIR IS TAKEN FROM A WARM ROOM AND PLACED IN A COOLER ROOM. THE BALLOON WILL
A. GET SMALLER.
B. GET LARGER.
C. BREAK.
D. STAY THE SAME SIZE.

******************************************************************************************

CHOOSE THE CORRECT ANSWER.
A FORCE AT THE SURFACE OF AN OBJECT THAT MAKES IT HARD TO MOVE ACROSS IT IS

A. LUBRICATION.
B. PRESSURE.
C. GRAVITY.
D. FRICTION.

THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF FRICTION BY SELECTING THE PROPERTIES OF FRICTION THAT ARE PRESENT IN VARIOUS GIVEN SITUATIONS.

CHOOSE THE CORRECT ANSWER.

A DOOR OPENS WITH DIFFICULTY, IT ALSO SQUEAKS. WHAT FORCE IS AT WORK?

A. FRICTION
B. GRAVITY
C. PRESSURE
D. TENSION

FRICTION MAKES IT TO MOVE THINGS.

A. EASIER
B. HARDER
C. NICER
D. EFFORTLESS

SLIDING FRICTION BETWEEN TWO SURFACES CAN BE REDUCED BY

A. INCREASING THE PRESSURE ON BOTH SURFACES.
B. SMOOTHING AND POLISHING BOTH SURFACES.
C. LUBRICATING THE SURFACES.
D. B AND C.

WHICH ONE OF THE FOLLOWING SURFACES WILL OFFER THE MOST FRICTION?

A. WAXED PAPER
B. ICE
C. BLOTTER
D. WAXED FLOOR

WHICH ONE OF THE FOLLOWING SURFACES WOULD BEST DECREASE FRICTION?

A. LINOLEUM FLOOR
B. CARPETED FLOOR
C. CEMENT FLOOR
D. WAXED FLOOR

IN WHICH OF THE FOLLOWING SITUATIONS IS THE FORCE OF FRICTION A HINDERANCE?

A. TIRE TREADS ON A CAR
B. WRITING WITH A PENCIL
C. BICYCLE BRAKES
D. SCREWING A NUT ON A BOLT
There is friction between wheels and axles. The heavier the load, the more wear there is on the axle. Which of the following would *not* help to lessen the friction?

A. Cover the two surfaces with grease
B. Make the hole in the wheel larger
C. Make the wheel holes and the axle smoother
D. Make the load lighter
E. Use ball bearings

The student will demonstrate a knowledge of the structure of the atom by identifying its composition and characteristics. Choose the correct answer.

The basic parts of an atom are
A. Electron, proton, nucleus.
B. Nucleus, orbit, proton.
C. Electron, neutron, proton.
D. Electron, particle, neutron.

The nucleus of an atom contains
A. Protons and electrons.
B. Neutrons and negatives.
C. Protons, electrons and neutrons.
D. Protons and neutrons.

In atomic reactions an electron and a proton sometimes take the place of a
A. Neutron.
B. Nucleus.
C. Negative.
D. Molecule.

Which of the following is grouped together in shells or orbitso:
A. Protons
B. Neutrons
C. Electrons
D. Atoms
E. Molecules

Which of the following statements is *not* correct?
A. The neutron has a negative charge.
B. The neutron has no charge.
C. The proton has a positive charge.
D. The electron has a negative charge.

Scientists define the ability to do work as
A. Thinking.

Choose the correct answer.

Scientists define the ability to do work as
A. Thinking.
THE STUDENT CAN DISTINGUISH BETWEEN POTENTIAL ENERGY STORED AND KINETIC ENERGY ENERGY OF MOTION BY SELECTING EXAMPLES OF EACH.

CHOOSE THE CORRECT ANSWER.

ALL OF THE FOLLOWING HAVE POTENTIAL ENERGY *EXCEPT*
- A. DRY CFL.
- B. COAL.
- *C. WIND.
- D. WOUND SPRING.

WHICH OF THE FOLLOWING ITEMS IS NOT AN EXAMPLE OF KINETIC ENERGY?
- A. ROCKS ROLLING DOWN A HILL.
- B. AN UNEXPLODED STICK OF DYNAMITE.
- *C. A BLY BALL TO THE LEFT FIELD.
- D. WATER FLOWING OVER A DAM.

WHEN AN Object HAS THE CAPACITY TO DO WORK, IT HAS ENERGY.
- A. POTENTIAL
- B. MECHANICAL
- C. CONDUCTIVE
- *D. KINETIC

THE ENERGY OF MOTION IS
- A. MOLECULAR.
- B. MOVEMENT.
- *C. KINETIC.
- D. POTENTIAL.

THE STUDENT CAN APPLY THE CONCEPTS THAT EVAPORATION REQUIRES HEAT ENERGY AND THAT CONDENSATION RELEASES HEAT ENERGY BY SELECTING ILLUSTRATIONS OF THIS.

CHOOSE THE CORRECT ANSWER.

WHICH OF THE FOLLOWING CAN BE EXPLAINED BY THE CONCEPT, CONDENSATION RELEASES HEAT ENERGY?
- A. WATER CAN BE BOILED IN A PAPER CUP.
- B. PERSPIRING HELPS TO KEEP US COOL.
- *C. A JUG OF COLD LEMONADE GETS WARM WHEN LEFT OUT IN THE SUN.
- D. A FOG LIFTS AS THE MORNING SUN SHINES.

THE STUDENT CAN APPLY THE CONCEPT THAT A LOSS OR GAIN OF HEAT AFFECTS MOLECULAR MOTION BY CHOOSING AN EXAMPLE THAT ILLUSTRATES
CHOOSE THE CORRECT ANSWER.

WHICH STATEMENT IS TRUE?

A. THE SAME AMOUNT OF HEAT IS RELEASED WHEN WATER CHANGES TO STEAM AS WHEN STEAM CONDENSES.
B. STEAM WILL CAUSE A BURN MORE THAN BOILING WATER.
C. MOLECULES OF STEAM MOVE SLOWER THAN MOLECULES OF BOILING WATER.
D. AS ICE IS HEATED, ITS MOLECULES MOVE AT THE SAME SPEED.

************************

THE STUDENT CAN APPLY SIR ISAAC NEWTON'S LAWS OF MOTION BY CHOOSING THE LAW WHICH DESCRIBES AN EMPIRICAL SITUATION.

SELECT ONE OF SIR ISAAC NEWTON'S THREE LAWS OF MOTION.

A. FIRST
B. SECOND
C. THIRD
D. ALL OF ABOVE

A JET PROPELLED TOY AUTOMOBILE ILLUSTRATES WHAT LAW OF MOTION?

A BALL ROLLED ACROSS A TABLE AND THEN COMES TO A STOP ILLUSTRATES WHAT LAW?

STEPPING FROM A ROWBOAT AND THE BOAT SLIPS BACKWARD ILLUSTRATES WHAT LAW?

PUSHING A PIANO ACROSS THE ROOM ILLUSTRATES WHAT LAW?

OBJECTS THAT HAVE MAGNETIC ATTRACTION TO EACH OTHER ILLUSTRATE WHAT LAW?

************************

THE STUDENT WILL KNOW THE MEANINGS OF LITMUS PAPER, ACID, BASE, AND NEUTRAL SUBSTANCE BY SELECTING THE CORRECT DEFINITIONS FOR THESE TERMS.

CHOOSE THE CORRECT ANSWER.

THE DEFINITION OF LITMUS PAPER IS

A. RED CONSTRUCTION PAPER THAT BECOMES BLUE IN WATER.
B. PLANT COMPOUND EXTRACTED FROM LICHENS TO INDICATE ACID OR BASE.
C. BLUE CONSTRUCTION PAPER THAT BECOMES RED IN WATER.
D. NONE OF THE ABOVE.

AN ACID IS ANY OF A GROUP OF CHEMICAL COMPOUNDS THAT

A. TASTES SOUR AND TURNS BLUE LITMUS PAPER RED.
B. TASTES SWEET AND TURNS RED LITMUS PAPER BLUE.
C. IS TOO STRONG TO STORE IN GLASS BOTTLES.

A BASE IS ANY OF A GROUP OF CHEMICAL COMPOUNDS THAT

A. ALWAYS CONTAINS AN AMOUNT OF AMMONIA IN IT.
B. IS COLORLESS AND COMES ONLY IN LIQUID FORM.
C. IS STRONGER THAN ACIDS.
C. FEELS SLIPPERY AND TURNS RED LITMUS PAPER BLUE.
D. NONE OF THE ABOVE.

A NEUTRAL SUBSTANCE IS ANY OF A GROUP OF CHEMICAL COMPOUNDS THAT
* A. IS NEITHER AN ACID NOR A BASE.
  B. REACTS WITH BOTH BLUE AND RED LITMUS PAPER.
  C. NEITHER OF THE ABOVE.

THF STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF ACIDS AND BASES
BY SELECTING THE EXAMPLES OF EITHER ACIDS OR BASES FROM GROUPS OF
CHEMICAL COMPOUNDS.  %20

CHOOSE THE CORRECT ANSWER.

OF THE FOLLOWING GROUPS OF CHEMICAL COMPOUNDS, THE *ONE* THAT
CONTAINS *ONLY* ACIDS IS
  A. HYDROCHLORIC, SULFURIC, AMMONIA.
  B. AMMONIA, HYDROCHLORIC, TANNIC.
  C. HYDROCHLORIC, SULFURIC, TANNIC.
  D. AMMONIA, SULFURIC, TANNIC.

OF THE FOLLOWING GROUPS OF CHEMICAL COMPOUNDS, THE *ONE* THAT
CONTAINS *ONLY* BASES IS
  A. AMMONIA, WATER, BLEACH.
  B. AMMONIA, BLEACH, POTASSIUM HYDROXIDE.
  C. WATER, BLEACH, POTASSIUM HYDROXIDE.
  D. AMMONIA, WATER, POTASSIUM HYDROXIDE.

THE STUDENT WILL EVALUATE STATEMENTS PERTAINING TO ACIDS, BASES,
AND NEUTRAL SUBSTANCES AND SELECT THE STATEMENT THAT IS VALID IN
TERMS OF THE DEFINITION FOR A NEUTRAL SUBSTANCE.  %10

READ THE FOLLOWING STATEMENT AND DECIDE WHICH OF THE FOUR CHOICES
THAT FOLLOWS IS VALID.

A NEUTRAL SUBSTANCE IS NOT AN ACID OR A BASE WHILE AT THE SAME
TIME IT IS BOTH AN ACID AND A BASE.
* A. THIS STATEMENT IS TRUE BECAUSE WHEN TESTED WITH LITMUS PAPER
    AND PH, THE NEUTRALITY OF THE SUBSTANCE WILL BE PROVEN
    EVEN THOUGH THE SUBSTANCE WAS MADE BY COMBINING EQUAL
    QUANTITIES OF AN ACID AND A BASE.
  B. THIS STATEMENT IS FALSE BECAUSE A SUBSTANCE CAN BE ONLY ONE
    THING; IN THIS CASE NEUTRAL. IT CAN NEVER BE TWO THINGS AT
    THE SAME TIME, AN ACID OR A BASE.
  C. THIS STATEMENT IS TRUE BECAUSE ACIDS, BASES AND NEUTRAL
    SUBSTANCES ARE ALL CHEMICAL COMPOUNDS AND CAN EITHER BE
    COMBINED OR SEPARATED AT ANY TIME.
  D. THIS STATEMENT IS FALSE BECAUSE ACIDS AND BASES WILL NOT
    READILY FORM WHEN COMBINED UNLESS THE ACID AND BASE ARE BOTH
    EQUALLY STRONG NEUTRAL SUBSTANCES OR EQUALLY WEAK.

AFTER HAVING STUDIED GRAVITY THE CHILD CAN ANALYZE STATEMENTS ON
The effects of gravity on various bodies, by choosing the best explanation for a given phenomenon.

After reading the following statement, decide which of the choices is the best explanation.

With all things being equal, a rocket can be blasted off from the moon with six times the weight of a rocket being blasted off on earth.

A. This is explained by the fact that the moon is so far away from the earth.
B. This is explained by the fact that the gravitational force on the moon is less than that on the earth.
C. This is explained by the fact that the moon is moving faster than the earth and this speed helps lift more weight into space.
D. This is explained by the fact that the gravitational force is greater on the moon than it is on earth.

The student can demonstrate an understanding of rocket engines and jet engines by choosing the major differences in the two.

Choose the correct answer.

Of the following, the one which is a major difference between a rocket and a jet engine is:

A. The amount of fuel used in reaching outer space.
B. The rocket engine doesn’t need air from the outside.
C. A rocket uses only solid fuel to blast off.
D. None of the above.

Of the following, the one which is a major difference between a rocket and a jet engine is:

A. The amount of thrust possible.
B. The design of the combustion chamber.
C. The oxidizer used.
D. None of the above.

The child will demonstrate an understanding of Newton’s first law of motion by choosing from a list the best example of this principle.

Choose the correct answer.

Of the following items, the one which best illustrates Newton’s first law of motion is:

A. Pulling a tablecloth off a table with dishes remaining on the table.
B. Twirling a hula-hoop around your waist for three minutes.
C. Making a sharp turn in an automobile.
D. None of the above.
I. The student will know the meaning of density by selecting the correct definition for it.

Choose the correct answer.

Density is defined as:
A. The buoyancy of a substance.
B. The thickness of the air over the ocean.
*C. The mass of a substance per unit volume.

II. The student will comprehend the characteristics of water pressure by choosing those descriptions of water pressure from a list.

Choose the correct answer.

Of the following, the one which is characteristic of water pressure is:
*A. Water pressure is the same in all directions.
B. Water pressure is different in all directions.
C. Water pressure decreases with distance.

Of the following, the one which is characteristic of water pressure is:
*A. Water pressure stays constant in any depth.
B. Water pressure increases with depth.
C. Water pressure decreases with depth.

Of the following, the one which is characteristic of water pressure is:
*A. Liquids exert pressure at different levels.
B. Liquids don't exert pressure at any level.
C. Liquids exert constant pressure at all depths.

III. The student can apply knowledge of the effects of temperature on the kinetic energy of molecules by identifying the effects of changes in temperature.

Choose the correct answer.

On a recent automobile trip just prior to entering the desert at noon, a service station attendant suggested that we check the pressure of our tires. His concern was:
A. There are fewer molecules in desert air.
B. The molecules in the air will move more slowly causing the pressure to be reduced.
*C. The molecules in the air will move more rapidly causing the pressure to increase.
D. Molecules are closer together during the hottest part of the day.

An automobile ride may become rougher as speed and distance increases because:
A. The engine does not function well when hot.
B. The shock absorbers are not efficient at high speeds.
C. The suspension system is unable to absorb the extra force.
*D. All of the above.
"THE TIRES DO NOT ABSORB ROAD SHOCKS AS WELL BECAUSE OF INCREASED PRESSURE.
D. THE ACTION OF THE SPRINGS IMPROVES."

The game was played in -13 degree F. temperatures. The game ball was inflated to 5 pounds pressure in the locker room. What was the pressure of the ball at the end of the game?
* A. Less than 5 pounds
* B. Greater than 5 pounds
* C. 5 pounds

THE STUDENT CAN SHOW HIS COMPREHENSION OF GRAVITATION BY IDENTIFYING THE EFFECT OF MASS UPON WEIGHT. %19

Choose the correct answer.

An object weighing 100 pounds on earth will weigh less on the moon because
* A. The moon is smaller and has less mass.
* B. The moon is 240,000 miles from the earth.
* C. The period of rotation and revolution of the moon are equal.
* D. The moon travels rapidly on its axis.

THE STUDENT WILL APPLY HIS KNOWLEDGE ABOUT THE DIFFERENCE IN THE EXPANSION OF VARIOUS METALS BY ANTICIPATING CORRECTLY THE ACTION OF THESE METALS IN A NEW SITUATION. %21

This is a thermostat that is sensitive to the temperature conditions of a room set at 72 degrees F. Connection between points A and B will turn the furnace on. The connection of points B and C will turn the furnace off.

As the temperature of the room drops the bar contracts but the
* A. Brass contracts more.
* B. Steel contracts more.
* C. Brass and steel contract the same.

As the temperature of the room rises the bar expands but the
* A. Steel expands more.
* B. Brass expands more.
* C. The brass and steel expand the same.

THE STUDENT WILL APPLY HIS KNOWLEDGE OF 5 IMPORTANT SOURCES OF HEAT BY SELECTING THE CORRECT SOURCE OF HEAT FOR A GIVEN SITUATION. %19

Directions - select the correct source of heat using
- S - The sun
- C - Chemical action
- M - Mechanical
- N - Nuclear
- E - Electrical
A CAMPFIRE  *C
A ROPE BURN  *M
A TOASTER  *E
A BODY TEMPERATURE OF 98.6 DEGREES F.  *C
OCEAN TEMPERATURE  *S
GAS STOVE  *C
A LIGHT BULB  *E
ATOM BOMB  *N
AIR TEMPERATURE OUTSIDE  *S
TEMPERATURE OF MOVING CAR TIRES  *M

THE STUDENT WILL APPLY HIS KNOWLEDGE OF HEAT MOVEMENT BY SELECTING ONE OF THREE CORRECT METHODS OF MOVEMENT GIVEN SPECIFIC CONDITIONS. %10a

CHOOSE THE CORRECT LETTER CORRESPONDING TO THE TYPE OF MOVEMENT.
A. CONDUCTION
B. CONVECTION
C. RADIATION

WARM AIR RISES IN A ROOM.  *B
SMOKE RISES FROM A CHIMNEY.  *B
HEAT IS FELT COMING OUT OF THE SIDEWALK AT NIGHT.  *C
FROST ON A WINDOW MELTS WHEN A PERSON PUTS HIS HAND ON IT.  *A
HEAT IS FELT COMING OUT FROM A LIGHTED LIGHT BULB.  *C
A PERSON BURNS HIS HAND ON A HANDLE OF A PAN ON THE STOVE.  *A
THE GULF STREAM FLOATS.  *R
A CAR BUMPER IS HOT TO TOUCH AFTER SITTING IN THE SUN.  *C
COPPER USED AS A COATING ON THE BOTTOM OF PANS.  *A
THE OUTSIDE OF AN OVEN DOOR GETS HOT WHEN THE OVEN IS ON.  *A

THE STUDENT WILL BE ABLE TO ANALYZE DATA ON AIR PRESSURE AT DIFFERENT ALTITUDES AND SELECT CONCRETE INTERPRETATIONS BASED ON THE DATA. %2a
DIRECTIONS - ANALYZE THE CHART BELOW TO MAKE THE FOLLOWING CONCLUSIONS.

<table>
<thead>
<tr>
<th>ALTITUDE IN FEET</th>
<th>PRESSURE IN POUNDS PER SQUARE INCH</th>
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</thead>
<tbody>
<tr>
<td>SEA LEVEL</td>
<td>14.7</td>
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<tr>
<td>1,000</td>
<td>14.2</td>
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<td>30,000</td>
<td>4.4</td>
</tr>
<tr>
<td>50,000</td>
<td>1.7</td>
</tr>
</tbody>
</table>

THE AMOUNT OF PRESSURE AIR EXERTS AT THE SURFACE OF THE EARTH IS
A. CLOSE TO 14 POUNDS PER SQ. INCH.
B. CLOSER TO 20 POUNDS PER SQ. INCH.
*C. CLOSER TO 15 POUNDS PER SQ. INCH.

FROM 5,000 FT. ABOVE SEA LEVEL TO 15,000 FT. ABOVE SEA LEVEL THE AIR PRESSURE IS
A. GREATER.
*B. LESS.
C. THE SAME.

THE STUDENT WILL DEMONSTRATE AN UNDERSTANDING OF AIR PRESSURE AT THE SURFACE OF EARTH BY SELECTING A CORRECT EXPLANATION FOR IT. %10

CHOOSE THE CORRECT ANSWER.

AIR EXERTS A PRESSURE OF 14.7 LBS. PER SQ. INCH AT THE EARTH'S SURFACE BECAUSE THE AIR
A. NEAR THE SURFACE IS COLD AND THEREFORE IS HEAVY.
B. NEAR THE SURFACE HAS MUCH WATER FROM THE OCEANS AND LAKE ON THE SURFACE.
*C. MOLECULES NEAR THE SURFACE ARE SQUEEZED BY THE WEIGHT OF ALL THE AIR ABOVE IT.

THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF THE PRINCIPLES OF MOLECULAR KINETIC ENERGY BY INDICATING WHETHER HEAT IS BEING ADDED TO OR TAKEN FROM GIVEN SUBSTANCES IN GIVEN SITUATIONS. %9

THE FOLLOWING LIST OF NINE ITEMS DESCRIBES TEN DIFFERENT THINGS THAT MIGHT HAPPEN TO DIFFERENT SUBSTANCES TO MAKE THEM EXPAND, CONTRACT, OR CHANGE THEIR STATE. IN THE SPACE PROVIDED CHOOSE,

A. IF HEAT IS BEING ADDED TO THE SUBSTANCE.
B. IF HEAT IS BEING TAKEN FROM THE SUBSTANCE.
*C. IF NO HEAT IS BEING ADDED TO *OR* TAKEN FROM THE SUBSTANCE.
ICE TURNS TO LIQUID WATER. *A
A PERFUME BOTTLE IS OPENED AND THE ODOR FILLS THE ROOM. *C
THE GAS IN A SEALED BALLOON BEGINS TO EXPAND. *A
AIR IS BEING PUMPED INTO A TIRE. *C
STEAM TURNS TO LIQUID WATER. *B
FREON GAS IN A REFRIGERATOR IS CHANGED TO LIQUID FREON BY THE REFRIGERATOR MOTOR. *B
STEEL IS MELTED TO A LIQUID AT THE STEEL MILL. *A
THE MERCURY IN A THERMOMETER RISES IN ITS TUBE. *A
HUMIDITY BECOMES DROPS OF WATER ON THE OUTSIDE OF A GLASS OF ICED TEA. *B

*****************************************************************************

THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF MODES OF HEAT TRANSFER BY IDENTIFYING THE SPECIFIC MODE OF TRANSFER IN GIVEN SITUATIONS. %110

THE FOLLOWING LIST OF ITEMS DESCRIBES CASES IN WHICH HEAT ENERGY IS OR IS NOT BEING TRANSFERRED. IN THE SPACE PROVIDED CHOOSE

A. IF HEAT IS BEING TRANSFERRED BY CONDUCTION.
B. IF HEAT IS BEING TRANSFERRED BY CONVECTION.
C. IF HEAT IS BEING TRANSFERRED BY RADIATION.
D. IF HEAT IS NOT BEING TRANSFERRED AT ALL.

THE AIR ABOVE A BLACKTOP PARKING LOT IS RISING. *B
THE GULF STREAM IS A CURRENT THAT CARRIES WARM WATERS ACROSS THE ATLANTIC OCEAN. *B
THE SUN HEATS THE SURFACE OF THE MOON. *C
THE HANDLE OF A FRYING PAN GETS HOT. *A
THE CEILING OVER A RADIATOR GETS WARM. *B
A GLASS OF ICY WATER ON A TABLE BECOMES ROOM TEMPERATURE. *A
AN INFRARED LAMP IN THE CEILING ARE USED TO BAKE THE PAINT ONTO A NEW CAR. *C
THE COILS INSIDE A FREEZER MAKE THE AIR COLD. *A
THE SODA POP IN A THERMOS STAYS PERFECTLY COLD. *D
I FEEL THE HEAT FROM A FIREPLACE ON THE FRONT OF MY BODY, BUT NOT ON MY BACK. *C
A RED-HOT PIECE OF METAL, SUSPENDED IN A VACUUM CHAMBER WITH INSULATED CORD, BECOMES COOL. *C
THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF THE DEFINITION OF WORK AS FORCE OVER DISTANCE BY CHOOSING THE CORRECT FORMULA FROM A GIVEN LIST AND THEN APPLYING THE FORMULA TO GIVEN SITUATIONS. **%5o**

**CHOOSE THE CORRECT ANSWER.**

THE FORMULA THAT REPRESENTS THE SCIENTIFIC DEFINITION OF *WORK* IS:

A. DISTANCE EQUALS FORCE X WORK
B. FORCE EQUALS DISTANCE OVER WORK
C. FORCE EQUALS DISTANCE X WORK
D. WORK EQUALS FORCE X DISTANCE

AN AIRPORT TRACTOR PULLS A JET TO THE RUNWAY. WORK EQUALS 5,000,000 FOOT-POUNDS. DISTANCE EQUALS 1000 FEET. THE TRACTOR PULLS WITH **LBS. OF FORCE.**

A. 5,000,000
B. 5,000
C. 500
D. 5,000

USING A SINGLE FIXFD PULLEY, WARREN LIFTS A BALE OF HAY 20 FT. THE BALE WEIGHS 50 LBS. HOW MUCH WORK IS DONE?

A. 50 FT. LBS.
B. 100 FT. LBS.
C. 1000 FT. LBS.
D. 500 FT. LBS.

BERT ROLLS A 60 LB. BARREL OF *MOTHER HUBBA'S MOLASSES* UP THE 4 FOOT RAMP. BERT DID **FT.-LBS. OF WORK.**

A. 240
B. 600
C. 480
D. 15

BERT WAS PUSHING ON THE BARREL WITH A FORCE OF **LBS.**

A. 60
B. 30
C. 40
D. 15

THE STUDENT WILL INTERPRET THE EFFECT OF HEAT UPON MOLECULES BY IDENTIFYING THE MOLECULAR CHANGE THAT OCCURS WHEN HEAT IS INDUCED. **%1o**

**CHOOSE THE CORRECT ANSWER.**

AS A MERCURY THERMOMETER GETS WARMER, THE MERCURY EXPANDS. WHAT HAPPENS WHEN MERCURY EXPANDS?

A. MORE MOLECULES OF MERCURY APPEAR
B. THE SPACE BETWEEN THE MOLECULES GETS LARGER
C. THE MOLECULES EXPAND IN SIZE

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THE STUDENT CAN APPLY RESULTS OF CARBON DIOXIDE EXPERIMENTS BY CITING METHODS AND RESULTS OF TESTING FOR THIS GAS.  

**THE STUDENT WILL APPLY HIS KNOWLEDGE OF THE EFFECTS OF TEMPERATURE CHANGE ON MOLECULE MOVEMENT BY IDENTIFYING OUTCOMES TO HYPOTHETICAL SITUATIONS.**

**CHOOSE THE CORRECT ANSWER.**

**TO TEST WHETHER A GAS IS CARBON DIOXIDE YOU SHOULD COMBINE IT**

- A. WITH VINEGAR
- B. WITH LIMEWATER
- C. WITH WATER

**WHEN CARBON DIOXIDE COMBINES WITH CALCIUM HYDROXIDE**

- A. CALCIUM CARBONATE AND WATER ARE FORMED
- B. LIMEWATER IS FORMED
- C. OXYGEN IS RELEASED

**WHEN CARBON DIOXIDE COMBINES WITH CALCIUM HYDROXIDE**

- A. IT TURNS A CLOUDY MILKY COLOR
- B. IT REMAINS A CLEAR COLORLESS LIQUID
- C. IT FORMS A ODORLESS COLORLESS GAS

A PERSON TOOK A LITTLE PLAIN SODA WATER AND ADDED IT TO LIMEWATER. A MILKY WHITE SUBSTANCE APPEARED. WHAT COMPOUND MUST HAVE BEEN PRESENT?

- A. CARBONIC ACID
- B. VINEGAR
- C. CARBON DIOXIDE

A PERSON BLOWS THROUGH A STRAW INTO LIMEWATER. THE RESULT WILL BE THE FORMATION OF

- A. CALCIUM HYDROXIDE
- B. CALCIUM CARBONATE
- C. CARBON DIOXIDE

AN APPLE AND A DIME ARE EACH SEALED IN A PLASTIC BAG. IF AFTER 24 HOURS SOME LIMEWATER WAS POURED INTO EACH BAG, THE RESULTS WILL BE THE LIMEWATER IN

- A. THE BAG WITH THE APPLE WILL TURN CLOUDY
- B. THE BAG WITH THE DIME WILL TURN CLOUDY
- C. BOTH BAGS WILL TURN CLOUDY
- D. NEITHER OF THE BAGS WILL TURN CLOUDY

**THE EXPLANATION FOR THE CHANGE IN SIZE OF AN OBJECT WHEN IT GOES FROM A COOL PLACE TO A WARM PLACE**
**A. THE MOLECULES SPEED UP**

**B. THE MOLECULES SLOW DOWN**

**C. THE MOLECULES GET SMALLER.**

While driving on the toll road, a good tire had a blow out. This would most likely happen due to

A. **FRICION.**

*B. INCREASED MOLECULE MOVEMENT.*

C. TOO LITTLE AIR.

D. TOO MUCH AIR.

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The student will be able to apply Bernoulli's principle to various situations by identifying changes in air pressure.

**CHOOSE THE CORRECT ANSWER.**

Air traveling over a curved surface

* A. SPEDS UP.
B. SLOWS DOWN.
C. STAYS THE SAME.
D. GETS HARDER.

Molecules traveling quickly have

A. MORE PRESSURE.
B. NO PRESSURE.
*C. LESS PRESSURE.*
D. THE SAME PRESSURE.

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The student will demonstrate comprehension of kinetic energy by selecting the kinetic power source used by machines.

**CHOOSE THE CORRECT ANSWER.**

Windmills get their energy for work from

*A. AIR.*

B. WATER.
C. THEIR WINGS.
D. NONE OF THESE.

Steam engines get their energy for work from

A. HEAT.
B. WATER.
C. PISTONS.
D. FUEL.

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The student will apply the scientific fact that sound travels approximately 1.100 ft. per second by selecting the correct solution to a problem involving the calculation of the speed of sound.

**CHOOSE THE CORRECT ANSWER.**
WHILE YOU WERE LOOKING OUT A WINDOW DURING A STORM, YOU SAW A
STREAK OF LIGHTNING. YOU WERE ABLE TO COUNT BY THOUSANDS TO
4,000 BEFORE HEARING THE THUNDER. THE LIGHTNING WAS APPROXIMATE-
LY — COUNTING SECONDS IS SOMETIMES DONE BY COUNTING BY
THOUSANDS:
A. 40 FT. AWAY.
B. 4400 FT. AWAY.
C. 5528 FT. AWAY.

THE STUDENT KNOWS THE MEANING OF HYPOTHESIS BY SELECTING IT WHEN
GIVEN ITS DEFINITION.

CHOOSE THE CORRECT ANSWER.

WE CALL THE EDUCATED GUESS A SCIENTIST MAKES TO EXPLAIN A
PROBLEM.
A. AN EXPERIMENT
B. AN EXAMPLE
C. AN OBSERVATION
D. A HYPOTHESIS
E. A TEST

WHICH OF THE FOLLOWING WOULD BE AN EXAMPLE OF A HYPOTHESIS?
A. MAGNETISM HOLDS A PAPER CLIP UP.
B. THE PAPER CLIP FALLS.
C. PLACE A PIECE OF PAPER BETWEEN A MAGNET AND A PAPER CLIP.
D. THE CLIP IS PULLED TO THE MAGNET.

GIVEN A PARAGRAPH ON THE DISCOVERY OF RADIIUM AND ITS RELATION TO
ATOMIC ENERGY, THE CHILD WILL EVALUATE THE STATEMENT BY SELECTING
CONCLUSIONS FROM IT.

CHOOSE THE CORRECT ANSWER.

IN 1898 MADAME CURIE DISCOVERED RADIIUM. IT WAS DISCOVERED THAT
ATOMS OF RADIATION THREW OFF PARTICLES AND RADIATIONS THAT WENT
THROUGH FLESH AND EVEN SOME METAL. THIS RADIATION LED SCIENTISTS
TO BELIEVE THAT THEY COULD USE THE POWER GIVEN OFF TO DO MANY
THINGS THAT HAD PREVIOUSLY BEEN UNATTAINABLE.

ONE CONCLUSION FROM THIS PARAGRAPH IS
A. ATOMIC ENERGY IS OPERATING AT MAXIMUM CAPACITY.
B. ATOMIC ENERGY IS MORE POWERFUL THAN ANY OTHER FORM OF
ENERGY.
C. RADIATION COULD BE DANGEROUS TO THE BODY.
D. NONE OF THE ABOVE.

THE STUDENT CAN APPLY HIS KNOWLEDGE OF DENSITY BY SELECTING
WHETHER A GIVEN OBJECT WILL FLOAT OR SINK.
THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF THE RELATIONSHIP BETWEEN TEMPERATURE AND HEAT BY SELECTING THE CORRECT RESPONSES.

CHOOSE THE CORRECT ANSWER.

IN COMPARISON TO A CUP OF WATER AT 100 DEGREES F. A BATHTUB OF WATER AT 100 DEGREES F. CONTAINS
A. FASTER MOVING MOLECULES.
B. SLOWER MOVING MOLECULES.
C. THE SAME AMOUNT OF HEAT.
*D. A GREATER AMOUNT OF HEAT.

WHICH OF THE FOLLOWING CONTAINS THE *MOST* HEAT?
A. A BURNING MATCH
*B. THE PACIFIC OCEAN
C. A BATHTUB FILLED WITH ROILING WATER
D. LAKE MICHIGAN

LIGHT

THE STUDENT CAN DISTINGUISH BETWEEN THE PROPERTIES OF LIGHT AND SOUND BY SELECTING CHARACTERISTICS OF EACH IN GIVEN SITUATIONS.

CHOOSE THE CORRECT ANSWER.

LIGHT AND SOUND BEHAVE ALIKE IN MANY WAYS. WHICH STATEMENT IS TRUE ONLY OF LIGHT?
A. IT CAN BE REFLECTED.
B. IT CAN BE ABSORBED.
C. IT CAN TRAVEL IN STRAIGHT LINES.
*D. IT CAN TRAVEL THROUGH OUTER SPACE.

WHEN LIGHT HITS A MIRROR, THE LIGHT IS
A. REFLECTED.
B. DIFFUSED.
C. ABSORBED.
D. REFRACED.
E. FOCUSED.

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WHEN LIGHT HITS A MIRROR, THE LIGHT IS
A. REFLECTED.
B. DIFFUSED.
C. ABSORBED.
D. REFRACED.
E. FOCUSED.
Most of the light which hits a piece of black paper is
A. reflected.
B. diffused.
*C. absorbed.
D. refracted.
E. focused.

A rough surface causes light to be
A. reflected.
*B. diffused.
C. absorbed.
D. refracted.
E. focused.

A lens brings light to a point. The light has been
A. reflected.
B. diffused.
C. absorbed.
*D. refracted.
E. focused.

Which of the following is false?
A. Light can be absorbed and reflected.
B. Light is a form of energy.
C. Sometimes light behaves like a stream of particles.
*D. Sometimes light travels like waves.
E. Light and sound are the same forms of energy because they often behave alike.

The student will apply his knowledge of light reflection by selecting practical solutions to problems involving light reflection. In

Choose the correct answer.

A builder is constructing a photographic dark room. He will paint the walls a
A. yellow and use bright equipment.
*B. dark grey and use dull finished equipment.
C. dark color but make sure there is a large window for fresh air.

The student will be able to recall the fact that light travels in straight lines by identifying the correct description of light's path. In

Choose the correct answer.

Light travels
A. around bends and curves.
*B. in straight lines.
C. over hills and into valleys.
THE STUDENT WILL APPLY HIS KNOWLEDGE OF LIGHT REFLECTION BY IDENTIFYING ITEMS THAT REFLECT OR ABSORB LIGHT.

CHOOSE THE CORRECT ANSWER.

WHICH OF THE FOLLOWING ITEMS WILL ABSORB THE MOST LIGHT?
A. YELLOW DRESS
* B. PURPLE DRESS
C. LIGHT BLUE COAT
D. PALE PINK DRESS

WHICH OF THE FOLLOWING ITEMS WILL REFLECT THE MOST LIGHT?
A. BURNT FRYING PAN
* B. ALUMINUM PAN
C. DEEP GREEN PAN

THE STUDENT WILL BE ABLE TO ANALYZE LIGHT BEING PRODUCED BY A CHEMICAL CHANGE BY SELECTING CORRECT SOLUTIONS TO PROBLEMS INVOLVING THE PRODUCTION OF LIGHT.

CHOOSE THE CORRECT ANSWER.

WHEN A CANDLE BURNS, A CHEMICAL CHANGE TAKES PLACE. DURING THIS CHEMICAL CHANGE THE MOLECULES ARE
A. CHANGED INTO DIFFERENT MOLECULES AND ENERGY IS RELEASED.
* B. NOT CHANGED IN ANY WAY.
C. CHANGED BUT DO NOT RELEASE ENERGY.

THE ENERGY RELEASED FROM A BURNING CANDLE
A. IS ABSORBED BY THE FLAME.
* B. IS IN THE FORM OF HEAT AND LIGHT.
C. FORMS CARBON DIOXIDE AND WATER.

IF YOU WERE TO DESCRIBE TO SOMEONE THE CHEMICAL CHANGE TAKING PLACE WHEN A BUNSEN BURNER IS IGNITED, YOU WOULD SAY
A. THE GAS MOLECULES ARE MOVING RAPIDLY, GIVING OFF HEAT AND LIGHT.
* B. THE METHANE GAS IS COMBINED WITH AIR AND IGNITED. THE MOLECULES OF GAS ARE CHANGED INTO NEW MOLECULES. HEAT AND LIGHT ARE GIVEN OFF.
C. THE GAS MOLECULES ARE BEING SEPARATED BY THE AIR MOLECULES GIVING OFF CARBON DIOXIDE AND WATER VAPOR.
CRITICAL THINKING

READ THE PARAGRAPH BELOW AND CHOOSE THE MAIN IDEA FROM THE ALTERNATIVES GIVEN.

WATER CANNOT BE USED ON ALL FIRES. IT MAKES SOME FIRES HARD TO CONTROL. WATER SHOULD NEVER BE PUT ON BURNING OIL OR BURNING GASOLINE. OIL AND GASOLINE FLOT ON WATER. WATER SPREADS THE FLAMES FROM OIL AND GASOLINE.

A. WATER MAKES SOME FIRES HARD TO CONTROL.
B. WATER CANNOT BE USED IN ALL FIRES.
C. WATER SPREADS FLAMES FROM OIL AND GASOLINE.

A MICROSCOPE IS MADE UP OF SEVERAL PARTS. EACH PART HAS A NAME AND A PURPOSE. THE BASE IS THE PEDESTAL ON WHICH THE INSTRUMENT RESTS. CLOSE TO THE BASE IS A MIRROR. THE MIRROR REFLECTS LIGHT ONTO THE OBJECT BEING VIEWED. ABOVE THE MIRROR IS THE STAGE. A SLIDE (PIECE OF GLASS) IS PLACED ON THE STAGE. THE OBJECT TO BE VIEWED IS MOUNTED ON THE SLIDE.

A. THE MIRROR IS THE MOST IMPORTANT PART OF THE MICROSCOPE FOR IT REFLECTS.
B. OF THE SEVERAL PARTS OF A MICROSCOPE EACH IS NAMED AND HAS A JOB.
C. A SLIDE IS A PLAIN PIECE OF GLASS USED FOR PLACING SPECIMENS.
D. THE BASE IS THE MOST IMPORTANT PART BECAUSE IT HOLDS THE MICROSCOPE.

IN CITIES WATER IS OFTEN STORED IN RESERVOIRS. IT IS BROUGHT FROM MOUNTAIN STREAMS TO RESERVOIRS BY CANALS. THE WATER MOVES FROM RESERVOIRS INTO THE CITIES BY LARGE PIPES. IT COMES INTO OUR HOMES AND BUILDINGS BY PIPES.

A. EVERY CITY HAS A RESERVOIR.
B. WE HAVE EFFICIENT WAYS OF GETTING WATER INTO OUR HOMES.
C. THERE ARE MANY PIPES IN OUR CITIES.

THE UPPER PART OF A MICROSCOPE CONSISTS OF A STAND AND TWO TUBES. THE STAND HOLDS THE TUBES IN PLACE. THE UPPER TUBE FITS SNUGLY IN THE LOWER TUBE. THE SCIENTIST ADJUSTS THE LENSES TO HIS EYES BY TURNING KNOBS CALLED ADJUSTING WHEELS. THE ADJUSTING WHEELS CAUSE THE UPPER TUBE TO MOVE UP OR DOWN WITHIN THE LOWER TUBE.

A. LENSES OF A MICROSCOPE ARE MOST IMPORTANT IN VIEWING SPECIMENS.
B. THE TUBES OF A MICROSCOPE ARE CLOSE FITTING AND ADJUSTABLE.
C. THE MICROSCOPE IS DIVIDED INTO UPPER AND LOWER PARTS.
D. TWO TIGHTLY FITTING TUBES AND A STAND MAKE UP THE UPPER PART OF A MICROSCOPE.

AS LONG AS MAN HAS RAISED CROPS AS A SOURCE OF FOOD AND OTHER PRODUCTS, INSECTS HAVE DAMAGED HIS CROPS. BETWEEN 1870 AND 1880, LOCUSTS ATE MILLIONS OF DOLLARS WORTH OF CROPS IN THE MISSISSIPPI VALLEY. TODAY IN THE UNITED STATES THE COTTON BOLL WEEVIL DAMAGES ABOUT 300 MILLION DOLLARS WORTH OF CROPS EACH YEAR. ADDITIONAL MILLIONS
PLANT-EATING INSECTS ARE THE ONLY ENEMIES OF CROP RAISERS.

THE ELECTRIC EEL, A NATIVE FISH OF SOUTH AMERICA, DEFENDS ITSELF FROM ATTACKS OF ENEMIES BY A NATURAL ELECTRIC BATTERY. A DISCHARGE FROM THIS BATTERY IS POWERFUL ENOUGH TO STUN EVEN THE LARGEST ANIMALS. WHERE ROADS PASS THROUGH PONDS FREQUENTED BY THESE PECULIAR FISH, IT HAS OFTEN BEEN FOUND NECESSARY TO CHANGE THE LINE OF THE ROAD FOR FEAR OF THEM.

A. ROADS CANNOT PASS BY PONDS THAT HAVE ELECTRIC EELS.
B. THE ELECTRIC EEL HAS AN UNUSUAL WAY OF DEFENDING ITSELF.
C. ELECTRIC EELS CAN STUN EVEN LARGE ANIMALS WITH ITS ELECTRIC CHARGE.

TALK ABOUT CATS' EYES THAT CAN SEE IN THE DARK. MAN HAS MADE SOMETHING THAT CAN SEE WHEN IT IS SO DARK OR FOGGY THAT EVEN A CAT CANNOT SEE. WITH THIS EYE, AVIATORS CAN SEE TO LAND THEIR AIRPLANES IN ANY WEATHER, DAY OR NIGHT. SHIPS PILOTS WHO ONCE WERE AFRAID TO ENTER HARBORS DURING DARKNESS OR THICK FOG NOW ENTER UNDER THESE CONDITIONS WITHOUT FEAR. THERE WILL PROBABLY BE A HUNDRED OTHER USES FOR THIS WONDERFUL INVENTION CALLED RADAR.

A. RADAR HAS MANY USES FOR MAN.
B. RADAR IS BETTER THAN CATS' EYES.
C. RADAR IS USED ONLY BY AVIATORS AND SHIPS PILOTS.

WATER IS EVERYWHERE. THERE IS MORE WATER THAN LAND ON OUR EARTH. EVERYTHING THAT LIVES MUST HAVE WATER. PLANTS NEED WATER IN ORDER TO GROW. ANIMALS CANNOT LIVE WITHOUT WATER. WE USE WATER IN OUR HOMES FOR MANY PURPOSES.

A. ALL LIVING THINGS NEED WATER IN ORDER TO LIVE AND GROW.
B. WATER IS FOUND ON OUR EARTH.
C. WE USE WATER IN OUR HOMES.

WHEN LARGE AMOUNTS OF WARM WATER ARE DUMPED INTO A RIVER, THE RIVER ITSELF IS HEATED. THE TEMPERATURE OF THE WATER MAY BE RAISED ONLY A FEW DEGREES. YET THESE FEW DEGREES CAN CHANGE THE ANIMALS AND PLANTS LIFE IN THE RIVER. HEAT CAUSES A LOSS OF OXYGEN IN THE WATER. FISH NO LONGER DO WELL, AND SOME KINDS DIE. WITHOUT ENOUGH OXYGEN, BACTERIA IN THE RIVER CANNOT BREAK DOWN WASTE MATTER. THE RIVER IS NO LONGER CLEAN.

A. HEAT CAUSES WATER TO LOSE OXYGEN.
B. SOME FISH CANNOT SURVIVE IN WARM WATER.
C. LARGE AMOUNTS OF WARM WATER CAN BE DANGEROUS TO LIFE IN OUR RIVERS AND LAKES.

MOST SPIDERS BUILD WEBS TO TRAP OTHER INSECTS. BUT THE TRAP-DOOR SPIDER HAS ANOTHER WAY OF HUNTING. FIRST, IT DUGS A HOLE ABOUT TEN INCHES DEEP AND AN INCH AND A HALF WIDE. NEXT, IT MAKES A LID OF DIRT AND WEBBING. THIS TRAP DOOR MUST FIT OVER THE UPPER END OF THE HOLE LIKE A CORK FITS IN A BOTTLE.

A. HOW THE TRAP-DOOR SPIDER TRAPS INSECTS.
B. THE TRAP DOOR FITS LIKE A CORK FITS IN A BOTTLE.
C. The Trap-door Spider cannot build webs as other spiders do.

It is fall in the Midwest. The wheat fields look like a golden ocean. But it was not always this way. Long ago, many farmers had to give up growing wheat. There was little rain. The weather was too cold, and many plants had brown spots. The brown spots were a sign of wheat rust. When the farmers saw the wheat rust, they knew their wheat would die.

A. Wheat grows only in the Midwest.
B. Wheat will not grow without rain.
C. Bad weather conditions caused wheat rust.

Most ants are great fighters and often fight in organized armies. When one army wants to attack an ant hill, it sends scouts ahead and behind to look for danger. The ants swarm over the ant hill they wish to capture. If they are successful, they carry away the dead bodies of their enemies. They also carry the eggs of the enemy ants to their own homes. The ants that are hatched from these eggs become slaves. These slaves work very hard and have little time for rest. Sometimes the ants that are waited on all the time by the slaves become so helpless that they are not able to walk or even move.

A. Some ants become very lazy.
B. Ants are fierce fighters.
C. Ants fight in organized armies and use their captured enemies as slaves.

Scientists often take field trips. They learn about plant and animal communities by going on field trips. The scientists go to places where certain plants and animals live together. They may go into a forest, or they may go into a desert. There are plants and animals on the desert.

A. There are plants and animals on the desert.
B. Scientists often take field trips.
C. Scientists go to places where certain plants and animals live together.

Tadpoles have gills. They must live in the water. The gills take oxygen from the water. The tadpoles eat small plants. The small plants are found in the water.

A. Tadpoles have gills.
B. Tadpoles must live in the water.
C. Tadpoles eat small plants.

Here is an American toad. See its long tongue. The tongue is at the front of the toad's mouth. The American toad can easily flip out its tongue to catch insects. All toads and frogs catch insects in this way.

A. The American toad has a long tongue.
B. The toad flips his tongue to catch insects.
C. All toads and frogs catch insects in this way.

Frogs and toads hibernate as soon as the days become cold. They dig down into the mud. There they hibernate all winter. Hibernation is like a deep sleep. Animals do not eat while they are hibernating. They live on the fat stored in their bodies.

A. Frogs and toads dig into mud in the winter.
B. Hibernation is like a deep sleep.
C. Animals live on stored fat during their long sleep.

A fireman visited this class. The fireman talked to the
THE FIREMAN TOLD THE CHILDREN HOW TO CONTROL FIRE.
A. THE FIREMAN TOLD THE CHILDREN HOW TO CONTROL FIRE.
B. THE FIREMAN TOLD THE CHILDREN ABOUT SAFETY IN THE WOODS.
C. HE TALKED ABOUT SAFETY IN THE WOODS.

LOOK AT THE JET AIRPLANE ... DO YOU WONDER HOW IT MOVES? 0817
THE SECRET IS IN THE ENGINE. THE ENGINE BURNS FUEL. THE FUEL MAKES AN EXHAUST. THE EXHAUST CAUSES THE PLANE TO MOVE. IT IS REALLY NO SECRET.
*A. THE EXHAUST MAKES THE PLANE MOVE.
B. AIRPLANE ENGINES BURN FUEL.
C. THE FUEL MAKES AN EXHAUST.

A BIG SPACE ROCKET GOES UP, UP AND UP. IT GOES MUCH FASTER AND MUCH HIGHER THAN A FIREWORKS SKYROCKET. IT GOES ALL THE WAY INTO SPACE. BUT THE SPACE ROCKET AND THE SKYROCKET WORK IN MUCH THE SAME WAY. THEY BOTH HAVE ROCKET ENGINES.
*A. THE SPACE ROCKET AND THE SKYROCKET HAVE ROCKET ENGINES.
B. THE SPACE ROCKET AND THE SKYROCKET WORK IN MUCH THE SAME WAY.
C. THE SPACE ROCKET IS FASTER AND HIGHER THAN A FIREWORKS SKYROCKET.

MOST PLANTS HAVE SEEDS. THERE ARE MANY KINDS OF SEEDS. SEEDS USUALLY HAVE A COVERING TO PROTECT THEM. MANY PLANTS PRODUCE SEEDS AT THE TOP OF THE STEM. SOME PLANTS PRODUCE SEEDS IN THEIR FRUIT. SOMETIMES SEEDS ARE FOUND IN CLUSTERS. NEW PLANTS GROW FROM THE SEEDS.
*A. PLANTS NEED SEEDS IN ORDER TO GROW.
B. THERE ARE MANY KINDS OF SEEDS.
C. SEEDS MAY BE FOUND IN MANY DIFFERENT PLACES ON PLANTS.

LATE ONE AFTERNOON MIKE TOOK A TRAY OF ICECUBES OUT OF THE FREEZER AND HIS HAND STUCK TO THE TRAY. HE RAN WATER OVER HIS HAND AND THE TRAY TO GET HIS HAND LOOSE. WHICH QUESTION WOULD MIKE MOST LIKELY BE ASKING HIMSELF?
*A. IF I HAD GOTTEN THE TRAY THIS MORNING WOULD THE SAME THING HAVE HAPPENED?
B. WHY DID THE WATER FFL SO GOOOD?
C. WHAT IS WRONG WITH THE FREEZER?
D. WHY DID MY HAND STICK TO THE ICE TRAY?

10 YEAR OLD JERRY OPENED THE REFRIGERATOR. THE INSIDE FELT COOL, HOWEVER WHEN HE TOUCHED THE MOTOR OF THE REFRIGERATOR, IT FELT HOT. WHAT WOULD JERRY MOST LIKELY BE THINKING?
*A. AM I TOO YOUNG TO BE FOOLING AROUND WITH THE REFRIGERATOR?
B. WHY IS THE REFRIGERATOR COOL AND THE MOTOR HOT?
C. WHAT IS THE TEMPERATURE OF THE REFRIGERATOR AND THE MOTOR?
D. HOW CAN I COOL OFF THE MOTOR?

LATE ONE SUMMER NIGHT SUE WAS WALKING BAREFOOT ON THE SIDEWALK. THE NIGHT WAS COOL, BUT THE SIDEWALK FELT WARM. WHAT QUESTION WAS SUE LIKELY TO BE ASKING HERSELF?
*A. WHY IS THE SIDEWALK WARM?
B. SHOULD I HAVE WORN SHOES?
C. WHY IS THE EVENING SO COOLO?
D. WHAT IS MY FAVORITE SEASON?
ONE MORNING BILL POURED HOT INSTANT TEA INTO A RED GLASS CONTAINING ICE -- THE GLASS CRACKED. HIS SISTER MARY POURED THE TEA INTO A BLUE GLASS CONTAINING ICE AND A SPOON -- THE GLASS DID NOT BREAK. WHAT QUESTION MOST LIKELY WAS ON BILL'S MIND?

A. WHAT COLOR GLASSES ARE BEST FOR INSTANT ICE TEA?
B. WHY DID MY GLASS BREAK AND MARY'S DIDN'T?
C. WHAT DOES INSTANT TEA HAVE IN IT TO BREAK GLASS?
D. WHAT TIME OF DAY IS BEST FOR MAKING ICED TEA?

FRED COULDN'T GET THE LID OFF A JAR OF PICKLES. HE WORKED AT IT FOR 5 MINUTES. MARK CAME ALONG AND PUT THE JAR UNDER HOT WATER -- THE LID THEN CAME OFF EASILY. WHAT QUESTION IS FRED PROBABLY ASKING HIMSELF?

A. WHY IS MARK STRONGER THAN ME?
B. WHY ARE PICKLE JARS SO HARD TO OPEN?
C. HOW DID THE WATER HELP TO LOOSEN THE LID?
D. HOW LONG DOES IT TAKE TO OPEN PICKLE JARS?

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THE STUDENT WILL DEMONSTRATE HIS ABILITY TO DISTINGUISH BETWEEN FACT AND OPINION STATEMENTS BY CORRECTLY CATEGORIZING A GIVEN SET OF STATEMENTS. %46h

DIRECTIONS - IF THE STATEMENTS BELOW ARE FACTS, CHOOSE THE *A*, IF THE STATEMENT CAN *NOT* BE READILY PROVED OR DISPROVED, CHOOSE THE *B*.

FROGS AND TOADS ARE BOTH AMPHIBIANS. *A 820
FISH LIKE TO SWIM. *B 822
AIR HAS WEIGHT. *A 823
WORMS ARE FUN TO PLAY WITH. *B 824
BEAVER ARE BEAUTIFUL. *B 825
ANIMALS NEED AIR TO BREATHE. *A 826
POSSUMS ARE MAMMALS. *A 827
A RACCOON MAKES A NICE PET. *B 828
FISH GET AIR FROM WATER. *A 829
EVERY SECOND SOME 50 MILLION OF YOUR BODY CELLS DIE. *A 830
IT WOULD BE MARVELOUS TO SEE THE CELL MAGNIFIED 100,000 TIMES. *B 831
THE GREATEST SCIENTIFIC DISCOVERY WAS THE INVENTION OF THE HUMAN GENE BY CHEMICALS. *B 832
SOME SCIENTISTS BELIEVE THE GREATEST STUDY OF THE CELL CAN BE ACCOMPLISHED ONLY THROUGH STUDY OF THE CELL PARTS. *A 833

IN BACTERIOLOGY, THE MICROSCOPE IS RELIED UPON GREATLY TO ASSIST THE SCIENTIST IN HIS STUDY OF BACTERIA. *A 835
THE LENSES ON A MICROSCOPE ARE MARKED ACCORDING TO THEIR 836
MICROSCOPES, TELESCOPES, AND CAMERAS NEED LENSES TO HELP THE SCIENTIST DO HIS WORK. *A

MOST PLANTS HAVE SEEDS. *A

THERE ARE MANY KINDS OF SEEDS. *A

ALL SEEDS GROW INTO BEAUTIFUL PLANTS. *B

SEEDS NEED WATER AND GOOD SOIL IN ORDER TO GROW. *A

BIRDS, ANIMALS AND PEOPLE EAT SEEDS. *A

SOME PLANTS CAN PROTECT THEMSELVES. *A

SOME INSECTS EAT PLANTS. *A

THERE IS MORE WATER ON EARTH THAN LAND. *A

WATER IS ALWAYS HELPFUL TO MAN. *B

WATER HAS MANY USES IN OUR HOMES. *A

ALL PEOPLE PREFER WATER THAT COMES DIRECTLY FROM WELLS. *B

IN MOST CITIES WE USE WATER FROM A RESERVOIR. *A

EVERY LIVING THING MUST HAVE WATER. *A

WATER IS ALWAYS GOOD FOR DRINKING. *B

WATER POLLUTION IS THE MOST SERIOUS POLLUTION PROBLEM. *B

ALL INSECTS HAVE SIX LEGS. *A

ALL INSECTS HAVE THREE PARTS TO THEIR BODY. *A

ALL INSECTS LAY EGGS. *A

SOME INSECTS LIVE IN WATER. *A

ANIMALS EAT INSECTS. *A

A MAGNIFYING GLASS IS A SIMPLE MICROSCOPE. *A

IT IS MORE INTERESTING TO VIEW AN AMOEBA THAN RED BLOOD CELLS. *B

THE WING OF A BUTTERFLY IS THE MOST BEAUTIFUL SIGHT ONE CAN SEE WITH A MICROSCOPE. *B

SWARMS OF TINY ANIMALS CALLED PROTOZOA COME TO LIFE IN A DROP OF POND WATER. *A

KNOWLEDGE GAINED BY THE USE OF A MICROSCOPE AFFECTS OUR LIVES IN MANY WAYS. *A

THE NOSEPIECE OF A MICROSCOPE CONTAINS THE OBJECTIVE LENSE, WHICH IS A CONVEX LENS. *A
THE GREATER THE MICROSCOPE MAGNIFIES THE OBJECT, THE BETTER. *B

SCIENTISTS WITH MORE DEDICATION, COULD HAVE SOLVED THE RIDDLE OF THE VIRUS BY NOW. *B

THE LENSES ON A MICROSCOPE ARE MARKED ACCORDING TO THEIR MAGNIFYING POWER. *A

THE ELECTRON MICROSCOPE USES ELECTRONS INSTEAD OF LIGHT RAYS TO FORM AN IMAGE. *A

THE STUDENT WILL DEMONSTRATE HIS ABILITY TO RECOGNIZE STATED AND UNSTATED ASSUMPTIONS BY SELECTING THEM AFTER HAVING STUDIED A MICROSCOPIC SLIDE. %10 #DRAWING OR SLIDE OF AMOEBA

DIRECTIONS - ABOVE YOU SEE A DRAWING OF AN AMOEBA. DRAWINGS ARE IMPORTANT BECAUSE BY STUDYING THEM WE CAN LEARN CERTAIN FACTS. IF YOU BELIEVE THE PICTURE GIVES EVIDENCE TO THE STATEMENT, CHOOSE THE ** FOR EVIDENCE. IF THE STATEMENT HAS NO EVIDENCE FROM LOOKING AT THE PICTURE CHOOSE *NO* EVIDENCE.

AN AMOEBA IS A SINGLE CELL ORGANISM. *A

THE AMOEBA CAN REPRODUCE ITSELF. *B

PSEUDOPODS ARE ALSO CALLED THE AMOEBA'S FEET. *B

THE AMOEBA HAS SIX KNOWN PARTS. *A

THE NUCLEUS IS PART OF AN AMOEBA. *A

THE NUCLEUS IS DARKER BECAUSE IT IS THE PART OF THE CELL THAT HAS DIED. *B

A PARAMECIUM AND AN AMOEBA DIFFER ONLY IN SHAPE. *B

THE CILIA IS PART OF AN AMOEBA. *B

EACH PART OF THE AMOEBA HAS A NAME. *A

DURING REPRODUCTION THE NUCLEUS DIVIDES EXACTLY IN TWO. *B

THE STUDENT WILL DEMONSTRATE HIS ABILITY TO DRAW INFERENCES BY EVALUATING THE CERTAINTY OF SELECTED STATEMENTS BASED ON EVIDENCE IN THE PASSAGES. %31

STUDY THE DIAGRAM AND THE PARAGRAPH BELOW -- THEN INDICATE WHETHER THE STATEMENTS FOLLOWING ARE PROBABLY TRUE, PROBABLY FALSE, OR THAT THERE ISN'T ENOUGH EVIDENCE TO MAKE A JUDGEMENT.

USE THE FOLLOWING KEY.
A. PROBABLY TRUE
B. PROBABLY FALSE
C. CAN'T SAY -- NOT ENOUGH EVIDENCE

%NEED DIAGRAM OF REFRIGERATION UNIT
A simple diagram that shows how a refrigerator works. The fluid that is going through the coil is Freon. Freon starts out as a liquid at point A. As the Freon moves around it starts to evaporate into a gas. All liquids need heat for evaporation. As the gas reaches point B it goes into a condenser where it loses heat and becomes a liquid again.

Freon is the best fluid to use in refrigerator coils. *C

The Freon absorbed the heat in the refrigerator. *A

The refrigerator would still work without the condenser. *B

Freon in a gaseous state contains more heat than Freon in a liquid state. *A

Freon must lose heat to return into a liquid state. *A

Water doesn't need heat to evaporate. *B

The temperature inside the refrigerator is lower at noon than at 3 o'clock p.m. *C

The refrigerator works on the principle of radiation of heat. *B

This refrigerator runs on electricity rather than gas. *C

Opening and closing of the refrigerator door affects the Freon. *A

The ice absorbed the heat from the blocks of metals. *A

If each metal had been heated to a temperature 10 deg. higher than the original temperature, the outcome of the experiment would have been different. *B

This experiment proves the melting point of ice. *C

After heating the metals to the same temperature, each had a different rate of molecular movement. *B

The aluminum absorbed more heat than the other metals. *A

Each metal block was heated to 97 degrees F. *C

The copper absorbed more heat than the iron. *B

The final result of the experiment would have been the same if each block of metal had been heated to a different temperature. *B

Ice is a poor conductor of heat. *C

Metals absorb more heat than glass. *C

Directions: Read the passage below then read the statements following. Indicate:
A. If the statement is probably true.
B. If the statement is probably false.
C. If there is not enough evidence to make a decision.
Matter, a block of metal weighing one pound, was heated in a pan of water. Then it was weighed again. The weight of the block remained the same.

Matter has weight. *A

The temperature of the metal rose 10 degrees F. *C

The metal weighed one pound and 2 ounces after being heated. *B

Heat has weight. *B

Heat is not matter. *A

Heat is needed to change the temperature. *A

When ice is left in a warm room, nothing happens to the molecules. *B

Temperature and the rate of molecular movement are unrelated. *B

Water is important to scientists in the study of heat. *C

Heat is needed to change a solid to a liquid. *A

It takes a longer time for ice to change from a solid to a liquid than from a liquid to a gas. *C

Heat is needed to change a liquid to a gas. *A

Ice, water, and water vapor are the solid, liquid and gas states of water. *A

Adding heat to a substance makes its molecules move faster. *A

When ice is left in a warm room nothing happens to its molecules. *B

Read the definition of energy below. Then distinguish between facts that are relevant and facts that are not relevant in determining heat as a form of energy by correctly identifying the phrases.

A. Relevant
B. Not Relevant

Energy can do work or change matter. Energy often comes from motion. The faster the motion the greater is the energy. Forms of energy can be changed from one kind into another. Changes in energy can go back and forth.

The ocean contains more heat than a cup of boiling water. *B

The addition of heat can change water from a solid to a liquid. *A

Heat energy can be made by light. *A

Calorie is a measure of heat. *B

Heat energy can be made by chemicals. *A
Temperature is the measure of the rate of molecular motion. *B

Heat energy can be made by electricity. *A

The faster you rub your hands together the warmer they become. *A

Heat and temperature are not the same. *B

Heat is the energy produced by molecular motion. *A

Read the following paragraph about a town in the United States. Then decide which facts presented are relevant or irrelevant in determining the climate of this town. Choose

A. Relevant
B. Not Relevant

Maryville is a town of about 3,000 people located in the southwestern part of the United States. Many of the residents here own and operate seaside resort motels. Others earn their living by working in the nearby factories. The town's population has steadily grown since 1950.

The name of the town was Maryville. *B

The town's population has grown to 3,000 since 1950. *B

The town is located in the southwestern part of the U.S. *A

Many of the residents own and operate seaside resorts. *A

Others work in nearby factories. *B

Read the following paragraph about a bridge that warped. Then distinguish between relevant from irrelevant facts that would help to explain the cause of the warping. Choose

A. Relevant
B. Irrelevant

A bridge was built over the West River located in the Midwest, during the month of March. It was a two-lane bridge one-fourth mile in length. The builder was J. H. Smith & Co. This was not a draw bridge; therefore the concrete for the bridge was poured as one complete strip from beginning to end. Toward the end of June the same year the bridge began to warp.

The bridge was over the West River. *B

It was built during March. *A

It was a two-lane bridge. *B

The bridge was one-fourth of a mile long. *B

It was built by J. H. Smith & Co. *B

It was *not* a draw bridge. *B

The concrete was poured as one complete strip from end to end. *A

The bridge began to warp in June. *A
THE STUDENT WILL DISPLAY HIS ABILITY TO DISTINGUISH BETWEEN FACTS THAT ARE RELEVANT AND FACTS THAT ARE NOT RELEVANT TO A SITUATION OR PROBLEM BY CORRECTLY IDENTIFYING THE RELEVANT PHRASES.

READ THE FOLLOWING STATEMENT. CHOOSE *A* IF THE FACTS ARE RELEVANT TO THE STATEMENT. CHOOSE *B* IF THEY ARE *NOT* RELEVANT TO THE STATEMENT.

AS LONG AS MAN HAS RAISED CROPS AS A SOURCE OF FOOD AND OTHER PRODUCTS, INSECT HAVE DAMAGED HIS CROPS. THE PROBLEM STILL EXISTS TODAY.

BETWEEN 1870 AND 1880, LOCUSTS ATE MILLIONS OF DOLLARS WORTH OF CROPS IN THE MISSISSIPPI VALLEY. *A

MANY INSECTS ARE HELPFUL TO MAN. *B.

BIRDS HELP MAN BY CATCHING AND EATING INSECTS. *B

TODAY IN THE UNITED STATES THE COTTON BOLL WEEVIL DAMAGES ABOUT 800 MILLION DOLLARS WORTH OF CROPS EACH YEAR. *A

THERE ARE MANY DIFFERENT KINDS OF INSECTS. *B

ADDITIONAL MILLIONS OF DOLLARS ARE LOST EACH YEAR TO THE APPETITES OF PLANT-EATING INSECTS SUCH AS CORN BORERS, GYPSY MOTHS, AND POTATO BEETLES. *A

YOU ARE DOING A REPORT ON THE LOCOMOTION AND REPRODUCTION ABILITY OF THE AMOEBA FOR CLASS. READ THE FOLLOWING STATEMENTS AND DECIDE WHICH OF THEM WOULD HELP YOU. CHOOSE *A* IF THE STATEMENTS ARE RELEVANT. CHOOSE *B* IF THEY ARE *NOT* RELEVANT.

THE PSEUDOPODS OF AN AMOEBA MOVE FORWARD AND SURROUND FOOD PARTICLES. *A

WHEN THE AMOEBA DIES, IT CEASES TO MOVE. *B

WHEN THE AMOEBA HAS GROWN TO A CERTAIN SIZE, IT REPRODUCES BY DIVIDING IN TWO. *A

THE AMOEBA MOVES FORWARD BY PUSHING OUT LITTLE FINGERLIKE EXTENSIONS CALLED PSEUDOPODS. *A

THE AMOEBA IS A SINGLE CELL ANIMAL WHICH CAN BE SEEN ONLY WITH A MICROSCOPE. *B

EACH OF THE SIX PARTS OF THE AMOEBA HAVE A SPECIAL NAME. *B

YOU ARE DOING A REPORT ON THE AMOEBA FOR YOUR CLASS. BELOW ARE PARAGRAPHS ABOUT THE AMOEBA. DECIDE WHICH OF THEM WOULD HELP YOU. CHOOSE THE LETTER OF THE CORRECT ANSWER.

Darryl had always wanted to have an imaginary pet. One day as Darryl was looking in his microscope he saw something moving. He decided it must be an amoeba. What fun it was to find animals
IN DROPS OF WATER. PARTY DECIDED LIVE ANIMALS WERE DEFINITELY MORE FUN THAN IMAGINARY ONES.

A. THIS PARAGRAPH HELPS
B. THIS PARAGRAPH DOES NOT HELP

THE AMOEBA IS A SINGLE CELL ANIMAL. IT CAN NOT BE SEEN BY THE NAKED EYE. TO SEE AN AMOEBA, YOU MUST USE A MICROSCOPE. PLACE A DROP OF POND WATER ON A MICROSCOPE SLIDE. LOOK FOR A MASS OF JELLY THAT CAN MOVE AND CHANGE SHAPE QUICKLY. CHANCES ARE YOU HAVE SEEN AN AMOEBA.

*A. THIS PARAGRAPH HELPS
B. THIS PARAGRAPH DOES NOT HELP

THE AMOEBA AND EUGLENA ARE QUITE DIFFERENT. THE EUGLENA AND AMOEBA BOTH ARE SINGLE CELL ORGANISMS BUT THE EUGLENA IS GREEN IN COLOR. THIS GREEN COLOR IS CAUSED BY CHLOROPHYLL A SUBSTANCE FOUND IN PLANTS. SCIENTISTS ARE STILL NOT SURE WHETHER TO CALL A EUGLENA A PLANT OR AN ANIMAL. SOME SCIENTISTS HAVE SOLVED THIS DILEMMA BY CALLING THE EUGLENA HALF PLANT, HALF ANIMAL.

*A. THIS PARAGRAPH HELPS
B. THIS PARAGRAPH DOES NOT HELP

THE AMOEBA POSSESS ALL OF THE LIFE FUNCTIONS OF ANY OTHER ANIMAL. IT CAN MOVE EASILY FROM PLACE TO PLACE BY MEANS OF FINGER LIKE PSUEDOPODS. IT CAN GET FOOD AND DIGEST IT. THIS DIGESTED FOOD TURNS INTO A LIQUID. THE LIQUID BECOMES PART OF THE JELLY LIKE MASS CALLED PROTOPlasM. THE AMOEBA ALSO BREATHS, REMOVES ITS WASTE AND REPRODUCES BY DIVIDING IN TWO.

*A. THIS PARAGRAPH HELPS
B. THIS PARAGRAPH DOES NOT HELP

CHOOSE THE LETTER BEFORE THE FACT WHICH WOULD BEST HELP YOU TO WRITE A PARAGRAPH ON THE FOLLOWING IDEAS ABOUT PLANTS AND SEEDS.

SOME INSECTS DESTROY PLANTS.
A. CERTAIN WORMS EAT THE FRUIT OF PLANTS.
B. SOME INSECTS LIKE THE SWEET LIQUID IN CERTAIN FLOWERS.
C. SOME INSECTS USE THE LEAVES OF PLANTS AS PROTECTION.

SEEDS ARE FOUND IN MANY DIFFERENT PLACES ON PLANTS.
A. SEEDS ARE OF MANY DIFFERENT SHAPES.
B. MANY PLANTS GROW SEEDS IN CLUSTERS AT THE TOP OF THEIR STEMS.
C. BIRDS LIKE TO EAT SEEDS.

MOST PLANTS GROW FROM SEEDS.
A. FRUIT TREES ARE ONE KIND OF PLANT THAT GROW FROM SEEDS.
B. SEEDS NEED WATER IN ORDER TO GROW.
C. SOME FRUIT

PLANTS ARE USEFUL TO US.
A. PLANTS OFTEN LOOK GOOD AND SMELL NICE.
B. MANY PLANTS GIVE US FOOD.
C. SOME ANIMALS MAKE THEIR HOMES UNDER PLANTS.

LEAVES ARE IMPORTANT TO MOST PLANTS.
A. Feed for some plants is made in its leaves.
B. Leaves sometimes make a plant more beautiful.
C. Leaves of some plants change color in autumn.

Stems are an important part of many plants.
A. Some stems are thorny.
B. Stems carry water and food to the leaves and fruit of the plant.
C. Some stems are very thick.

You are writing a report on the types of homes of different animals. Read the following statements. If the statement would be relevant to the topic circle the *A*, if not circle the *B*.

Wasps live in a nest. *A*
Some animals are covered with hair. *B*
Fish live in water. *A*
Some animals make good pets. *B*
Some animals dig into the ground to live. *A*

You are writing a report on how animals secure food. Read the following statements. If the statement would be relevant to the topic circle the *A*, if not circle the *B*.

Many animals must hunt for food. *A*
Some animals are very fierce. *B*
Animals usually make their homes so food and water will be close by. *A*
Some animals eat plants, some eat other animals. *A*

You are writing a report on the different ways animals protect themselves. Read the following statements. If the statement would be relevant to the topic circle the *A*, if not circle the *B*.

Cats protect themselves with their claws and teeth. *A*
Some animals protect themselves by being able to run fast. *A*
Many animals live in the jungle. *B*
Color helps protect some animals from their enemies. *A*

You are writing a report on how animals are beneficial to man. Read the following statements. If the statement would be relevant to the topic circle the *A*, if not circle the *B*.

A rat is harmful and is called a pest. *B*
Some animals, such as sheep, give us material for clothing. *A*
Some animals are useful because they give us food. *A*
Animals often help each other. *A*
THE STUDENT WILL DISPLAY HIS ABILITY TO DISTINGUISH BETWEEN FACTS THAT ARE RELEVANT AND FACTS THAT ARE NOT RELEVANT TO A SITUATION OR PROBLEM BY CORRECTLY IDENTIFYING THE RELEVANT PARAGRAPHS.

READ THE PARAGRAPH.

YOU ARE STUDYING AIR TRANSPORTATION AND HAVE LEARNED THAT FOG IS AN ENEMY TO AIRLINES AND AIRPORT OPERATORS. YOU WANT TO WRITE A REPORT ON WAYS TO FIGHT FOG AND ARE GOING TO DO MORE READING TO LOCATE INFORMATION.

READ EACH OF THE FOLLOWING PARAGRAPHS AND TELL WHICH OF THEM WOULD HELP YOU FIND INFORMATION IN FIGHTING FOG. CHOOSE **A** IF THE PARAGRAPH IS RELEVANT, CHOOSE **B** IF IT IS NOT RELEVANT.

FOG IS A CONCENTRATION OF TINY WATER DROPLETS SUSPENDED IN THE AIR. IT MOST OFTEN OCCURS WHEN WARM, MOIST AIR IS SUDDENLY COOLED. WHEN THE WHITE, MISTY BLANKET HIDES RUNWAYS, AIRPLANES CANNOT TAKE OFF OR LAND. CHANGES IN FLIGHT SCHEDULES COST THE AIRLINES SEVERAL MILLION DOLLARS EACH YEAR. **B**


COLD FOG, WHICH OCCURS AT TEMPERATURES BELOW FREEZING, CAUSES A SMALL PERCENTAGE OF AIRPORT SHUTDOWNS, AND IS FAIRLY EASY TO ELIMINATE. HOWEVER, COLD FOG TOGETHER WITH SNOW OR ICE COVERED RUNWAYS CAN BE AS HAZARDOUS AS THE MORE DENSE WARM WEATHER FOG. **B**

FOG CAUSES AIRPORTS TO SEND SCHEDULED FLIGHTS TO OTHER AIRPORTS NEARBY. THIS, TOO, CAN BE VERY DANGEROUS. THE NEW GIANT JETS NEED LONGER RUNWAYS TO LAND THAN DO THE REGULAR PASSENGER JETS. MANY OF THE SMALLER AIRPORTS DO NOT HAVE RUNWAYS LONG ENOUGH TO ALLOW THE NEW JETS TO LAND WITH SAFETY, BUT FOG OFTEN FORCES THE HUGE AIRCRAFT TO USE SMALL AIRPORTS. **B**

IN 1969, THE UNITED STATES AIR FORCE ANNOUNCED A PLAN FOR USE WHEN WARM, DRY AIR LIES OVER A LAYER OF COLD FOG. A HELICOPTER HOVERS OVER THE FOG LAYER. THE WHIRLING ROTOR BLADES PUSH WARM, DRY AIR DOWN TO MIX WITH THE FOGGY LAYER AND CAUSE THE WATER DROPLETS TO EVAPORATE. **A**

FOR QUITE A FEW YEARS, AIRPORTS HAVE USED CLOUD-SEEDING METHODS TO DISSIPATE COLD FOG. AN AIRPLANE DROPS CRYSTALS OF DRY ICE INTO THE FOG. SOON, SNOW FALLS AND THE AIR CLEARS. **A**

WHICH OF THE FOLLOWING THREE STATEMENTS TELLS BEST WHAT YOU WERE READING TO FIND OUT?

1. **A**
2. **B**
3. **C**
A. WAYS AIRPORTS FIGHT FOG.
B. WHY FOG IS DANGEROUS.
C. WHAT CAUSES FOG.

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THE STUDENT WILL DEMONSTRATE HIS ABILITY TO RECOGNIZE DEGREES
OF DIFFICULTY IN PROOF BY SELECTING THE ONE THAT WOULD BE MORE
DIFFICULT TO PROVE THAN THE OTHERS. %5

CHOOSE THE CORRECT ANSWER.

WHICH OF THE FOLLOWING WOULD BE *MOST* DIFFICULT TO PROVE TRUE
OR FALSE?
A. THE TEMPERATURE OF A ROOM IS 78 DEG. F.
B. METALS EXPAND WHEN HEATED.
*C. THE IDEAL TEMPERATURE IS FOUND IN HAWAII.
D. GASES EXPAND WHEN HEATED.

WHICH OF THE FOLLOWING WOULD BE *MOST* DIFFICULT TO PROVE TRUE
OR FALSE?
*A. THE HIGHER THE TEMPERATURE OF COFFEE THE BETTER IT TASTES.
B. THE OCEAN CONTAINS MORE HEAT THAN A CUP OF HOT COFFEE.
C. HEAT FROM A CUP OF HOT COFFEE IS MOVED TO THE HANDLE BY
CONDUCTION.
D. THE TEMPERATURE OF THE COFFEE IS 105 DEGREES F.

WHICH OF THE FOLLOWING WOULD BE *MOST* DIFFICULT TO PROVE TRUE
OR FALSE?
A. A MERCURY THERMOMETER SHOWS THE RISE AND FALL OF TEMPERA-
TURE.
B. THE TEMPERATURE IS TOO HOT FOR TENNIS.
*C. THE TEMPERATURE IS RELATED TO MOLECULAR MOVEMENT.
D. HEAT AND TEMPERATURE ARE NOT THE SAME THING.

WHICH OF THE FOLLOWING WOULD BE HARDEST TO PROVE TRUE OF FALSE?
A. THE BODY TEMPERATURE IS ABOUT 98.6 DEGREES F.
*B. PEOPLE CAN'T THINK CLEARLY WHEN THE AIR TEMPERATURE IS HOT.
C. FRICTION CAUSES HEAT.

WHICH OF THE FOLLOWING WOULD BE HARDEST TO PROVE TRUE OR FALSE?
A. METALS CONTRACT WHEN COOLED.
B. MOLECULES MOVE CLOSER TOGETHER WHEN COOLED.
*C. HOT BATHS ARE MORE ENJOYABLE THAN COOL BATHS.
D. GASES CONTRACT WHEN COOLED.

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THE STUDENT WILL ANALYZE STATEMENTS DRAWN FROM A GIVEN
PARAGRAPH, BY IDENTIFYING THE STATEMENTS AS EITHER STATED OR
UNSTATED ASSUMPTIONS. %11

READ THE FOLLOWING SELECTION, IF THE STATEMENT BELOW THE
PARAGRAPH IS A STATED ASSUMPTION, CHOOSE THE *A*, IF THE
STATEMENT IS AN UNSTATED ASSUMPTION, CHOOSE THE *B*.

ICE IS WATER IN ITS SOLID STATE. IF YOU WERE TO LEAVE A
BLOCK OF ICE IN A WARM ROOM, THE ICE WOULD SOON TURN TO A LIQUID.
THE HEAT IN THE ROOM CAUSES THE ICE TO MELT, OR CHANGE FROM A
Solid to a liquid. As the water is heated still more, it begins to boil and changes from a liquid to a gas. Water in its gaseous state is called water vapor. The three substances are different because of the way the molecules move in each of them.

The three states of matter are solid, liquid and gas. *B

Water can be changed into 3 states of matter. *A

Heat is needed to change the temperature. *B

Heat is needed to change a solid to a liquid. *A

Heat is needed to change a liquid to a gas. *A

The molecules are moving faster in the water vapor than in the ice. *B

There is a difference in the movement of molecules in water and ice. *A

The molecules in water never stop moving. *B

As heat is added to water, the molecules move further apart. *B

There are molecules in ice, water, and water vapor. *A

Mercury thermometers are better than alcohol thermometers. *B

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Measurement

The student can demonstrate knowledge of the Fahrenheit and Centigrade °Celsius scales for measuring temperature by identifying relationships between the different scales. *A

Choose the correct answer. 1

0 Degrees C. and 32 degrees F. are based on a common point. This point is

A. The body temperature of mammals.
B. The freezing point of water.
C. The freezing point of alcohol.
D. The freezing point of mercury.

What temperature on the Fahrenheit scale is equal to 100 deg. on the Centigrade scale?

A. 100 degrees F.
B. 180 degrees F.
C. 212 degrees F.
D. Zero degrees F.

A temperature increase of one degree on the Centigrade scale represents an increase of how many degrees on the Fahrenheit scale?

A. 5/9 of one degree

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1559
1560
1561
1562
1563
1564
1565
1566
1567
1568
1569
0202
1303
1304
1305
B. 2.001 DEGREES
C. 1 DEGREE
D. 1.8 DEGREES

IN CHANGING A FAHRENHEIT TEMPERATURE TO THE CENTIGRADE SCALE IT IS NECESSARY TO
*A. SUBTRACT 32 DEGREES.
B. ADD 32 DEGREES.
*C. MULTIPLY BY 1.8 DEGREES.
D. DIVIDE BY 1.8 DEGREES.

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THE STUDENT WILL DEMONSTRATE HIS UNDERSTANDING OF THE RELATIONSHIP BETWEEN FAHRENHEIT AND CENTIGRADE BY CORRECTLY CHOOSING ITS EQUAL EXPRESSED IN TERMS OF CENTIGRADE OR VICE VERSA. %2p

CHOOSE THE CORRECT ANSWER.

50 DEGREES FAHRENHEIT EXPRESSED IN TERMS OF CENTIGRADE IS
A. 122 DEG.
B. 18 DEG.
C. 25 DEG.
*D. 10 DEG.
E. 90 DEG.

50 DEGREES CENTIGRADE EXPRESSED IN TERMS OF FAHRENHEIT IS
*A. 90 DEG.
B. 18 DEG.
C. 122 DEG.
D. 10 DEG.
E. 25 DEG.

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THE STUDENT WILL RECALL THE DEFINITION OF A SMALL CALORIE BY SELECTING THE CORRECT RESPONSE THAT APPLIES TO A SMALL CALORIE. %2p

CHOOSE THE CORRECT ANSWER.

A SMALL CALORIE IS THE AMOUNT OF HEAT NEEDED TO RAISE
A. ONE GRAM OF WATER THROUGH ONE DEGREE FAHRENHEIT.
B. ONE GRAM OF WATER THROUGH ONE DEGREE CENTIGRADE.
*C. ONE OUNCE OF WATER THROUGH ONE DEGREE FAHRENHEIT.
D. ONE OUNCE OF WATER THROUGH ONE DEGREE CENTIGRADE.

THE DEFINITION OF A BTU IS THE AMOUNT OF HEAT NEEDED TO RAISE THE TEMPERATURE OF ONE POUND OF WATER ONE DEGREE FAHRENHEIT. THE BTU'S EQUIVALENT IN THE METRIC SYSTEM IS THE
A. LARGE CALORIE.
B. CENTIGRADE.
C. GRAM.
*D. SMALL CALORIE.

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THE STUDENT WILL APPLY HIS KNOWLEDGE OF A SMALL CALORIE BY
SELECTING THE CORRECT RESULT OF AN EXPERIMENT.

CHOOSE THE CORRECT ANSWER.

**EIGHTEEN DROPS OF WATER WERE PUT INTO A TEST TUBE.**

**THE TEMPERATURE OF THIS WATER WAS MEASURED BY A CENTIGRADE THERMOMETER.** **THE TEST TUBE WAS HELD OVER AN ALCOHOL BURNER FOR 20 SECONDS.** **THE TEMPERATURE OF THE WATER WAS TAKEN AGAIN; IT ROSE 20 CENTIGRADE DEGREES.**

**THE WATER IN THE TEST TUBE GAINED 20 DEGREES C. AND**

A. **20 SECONDS.**
B. **20 GRAMS.**
*C. **20 SMALL CALORIES.**
D. **20 LARGE CALORIES.**

THE STUDENT CAN SHOW HIS UNDERSTANDING OF THE METRIC SYSTEM BY

CONVERTING GIVEN METRIC MEASUREMENTS TO HIGHER AND LOWER UNITS OF THE SYSTEM.

CHOOSE THE CORRECT ANSWER.

8 CM. IS THE *SAME* AS

A. **8 DM.**
*B. **80 MM.**
C. **800 MM.**
D. **NONE OF THESE**

50 MM. IS THE *SAME* AS

*A. **5 CM.**
B. **5 DM.**
*C. **500 CM.**
D. **NONE OF THESE**

18 DM. IS *SHORTER* THAN

A. **900 MM.**
*B. **200 CM.**
C. **1 M.**
D. **NONE OF THESE**

LONGER THAN 1 METER —

A. **9 DM.**
B. **85 CM.**
*C. **1200 M.**
D. **NONE OF THESE**

USING A CHART OF 4 BASIC CONVERSION FACTORS, THE STUDENT WILL SHOW HIS UNDERSTANDING OF CONVERSION BY CONVERTING GIVEN MEASUREMENTS FROM THE ENGLISH TO METRIC SYSTEM OR VICE-VERSA.

YOU HAVE USED *CONVERSION FACTORS* FOR METERS, CENTIMETERS, YARDS, AND INCHES. NOW BELOW YOU SEE FOUR *CONVERSION FACTORS* FOR *LIQUID* MEASURE IN THE ENGLISH AND METRIC SYSTEMS. USE THESE FACTORS TO SOLVE THE FOLLOWING SITUATIONS.
GIVEN -
1 LITTER EQUALS 1.06 QUART
1 CENTILITER EQUALS .04 FL. OZ.
1 QT. EQUALS .94 CL.
1 FL. OZ. EQUALS 2.94 CL.

JIM'S PET WORM IS 5 INCHES LONG. HOW MANY CENTIMETERS?
A. 1.95 CM.
B. 7.54 CM.
*C. 12.70 CM.
D. 11.70 CM.

TOM'S BABY SISTER IS 2 FEET TALL. HOW MANY CENTIMETERS TALL IS SHE?
A. 9.36 CM.
*B. 60.96 CM.
C. 26.54 CM.
D. 61.06 CM.

ONE FOOT IS EQUAL TO
A. 12.54 CM.
B. 4.68 CM.
*C. 30.48 CM.
D. 14.54 CM.

PATTI GREW 6 CM. LAST YEAR. HOW MANY CENTIMETERS?
*A. 2.34 IN.
B. 2.25 IN.
C. 15.24 IN.
D. 12.24 IN.

JOHN THREW A BASEBALL 55 YARDS. HOW MANY METERS IS THIS?
A. 59.95 CM.
B. 50.95 CM.
*C. 50.05 CM.
D. 49.05 CM.

IN EUROPE, TRACK MEN RUN THE 100 METER DASH. HOW MANY YARDS IS THIS RACE?
A. 910.00 YARDS
B. 91.00 YARDS
C. 10.90 YARDS
*D. 109.00 YARDS

PEGGY'S PET FROG WON A JUMPING CONTEST WITH A LEAP OF 80 CM. HOW MANY INCHES WAS THIS?
*A. 203.20 IN.
B. 163.20 IN.
C. 21.20 IN.
*D. 31.20 IN.

ALLAN MEASURES A SMALL TREE WITH A METRIC RULER. IT MEASURES 3 METERS. HOW MANY YARDS IS THIS?
*A. 3.27 YARDS
B. 4.09 YARDS
C. 3.91 YARDS
D. 2.73 YARDS.
THE STUDENT CAN SHOW HIS COMPREHENSION OF THE STANDARD MEASURES OF BOTH THE ENGLISH AND METRIC SYSTEMS BY ESTIMATING THE SIZE OF COMMON OBJECTS.

THESE QUESTIONS ASK YOU TO COMPARE MEASUREMENTS TO THINGS IN THIS CLASSROOM. YOU CAN SEE ALL OF THESE THINGS FROM YOUR DESK. LOOK AT THEM BEFORE YOU CHOOSE YOUR ANSWERS.

CLOSEST TO ONE METER IN LENGTH -
A. MR. RHODY.
*B. MR. RHODY'S ARM.
C. MR. RHODY'S HAND.
D. MR. RHODY'S HEAD.

CLOSEST TO ONE CENTIMETER IN LENGTH -
A. YOUR THUMB.
B. A BALL-POINT PEN.
*C. THE STAPLE IN THE TOP CORNER OF THIS QUIZ.
D. A WIRE PAPER CLIP.

THE STUDENT WILL DEMONSTRATE HIS COMPREHENSION OF THE DECIMAL BASIS OF METRIC UNITS, LEARNED THROUGH LINEAR METRIC MEASURE, BY IDENTIFYING RELATIVE SIZES OF LIQUID METRIC UNITS.

CHOOSE THE CORRECT ANSWER.

20 CENTILITERS IS THE SAME AS
A. 20 MILLILITERS.
B. 200 DECILITERS.
*C. 2 LITERS.
*D. NONE OF THESE.

3 LITERS IS THE SAME AS
A. 3 DECILITERS.
B. 3000 CENTILITERS.
*C. 3000 MILLILITERS.
D. NONE OF THESE.

850 MILLILITERS IS LESS THAN
A. 8 DECILITERS.
B. 400 CENTILITERS.
*C. 1 LITER.
D. NONE OF THESE.

8 DECILITERS IS MORE THAN
A. 1 LITER.
*B. 700 MILLILITERS.
C. 85 CENTILITERS.
D. NONE OF THESE.

MORE THAN ONE LITER...
*A. 11 DECILITERS
B. 100 CENTILITERS
C. 500 MILLILITERS
D. NONE OF THESE.
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