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Heat, Light, and Sound Test - Student Test Booklet

\*Make sure to put your answers in the answer document.

**Use the following information to answer questions 1-5.**



1. The sound in setup 3 was clearer than the sound in setup 1.

 Which statement explains why?

A. String creates an echo.

B. String vibrates more than wire.

C. Wire is used for real telephones.

D. Wire transmits sound better than string.

2. The two students want classmates to repeat the investigation so that they can compare results.

 What should the students communicate so that results may be compared?

A. materials and steps used in the investigation

B. conclusions about results from the investigation

C. where they got the idea for making model telephones

D. where to purchase the materials for model telephones

3. Which variable changed between setup 1 and setup 2?

A. the type of cups used

B. the number of cups used

C. the tightness of the string

D. the thickness of the string

4. Look at the picture and the table for the Model Telephone Investigation.

 In your **Answer Document**, explain why the sound was heard in setup 1.

 Then describe what happened to the sound energy in setup 2. (2 points)

5. Two other students investigate model telephones made with paper and plastic cups. They find that sound is

 transmitted better using plastic cups.

 The class wants to make a model telephone that makes the best sound possible. They use the results of both

 investigations.

 Which setup should they use?

1. plastic cups and tight string
2. paper cups and tight string
3. plastic cups and tight wire
4. paper cups and tight wire

6. Which of these animals can most likely make a sound with the lowest pitch?

A. bird

B. elephant

C. dog

D. cat

7. Through which of the following materials does sound travel fastest?

A. water

B. air

C. rubber

D. steel

8. Students bump into each other when they turn the corner in the hallway shown. They plan to place a mirror

 in the hall so that they can see one another before reaching the corner.

Where should they place the mirror?

A. position A

B. position B

C. position C

D. position D

9. Students plucked each rubber band on the instrument shown below.



Which rubber band produces a sound with the highest pitch?

A. rubber band A

B. rubber band B

C. rubber band C

D. rubber band D

10. A student plays his instrument on the stage of an empty auditorium. He hears the sound echo back to the

 stage. Later, the auditorium is full of people. He does not hear an echo.

 In your **Answer Document**, explain why sound echoes in an empty auditorium.

 Then, describe what happens to the sound that prevents an echo from being heard in a full auditorium.

 (2 points)

11. In the year 2350, the space craft Holloway explodes in outer space. Astronaut Mike Smith watches from a

 nearby planet. Which of the following would be true?

 A. Mike would hear a loud bang and see nothing.

 B. Mike would hear nothing and see a bright light.

 C. Mike would hear and see nothing.

 D. Mike would hear a low noise and see a bright light.

12. John is completing his science lab. He is confused about reflection and refraction and needs your help.

 In your **Answer Document**, explain what happens when light is reflected. Give an example using words or

 pictures.

 Then explain what happens when light is refracted. Give an example using words or pictures. (4 points)

13. Two juice containers are in a cooler. One is plastic and one is metal. The metal can feels colder than the

 plastic bottle. Students place a thermometer in each container. They find that the juices in the bottle and in

 the can are the same temperature.



 Why does the can feel colder than the plastic bottle?

 A. The metal can holds colder juice than the plastic bottle.

 B. Plastic is a better conductor of thermal energy than metal.

 C. Metal is a better conductor of thermal energy than plastic.

 D. The outside of the metal can is drier than the plastic bottle.

14. People wear hats when outside in the winter. How do hats help people stay warm?

 A. Hats stop thermal energy from leaving their heads.

 B. Hats slow down thermal energy leaving their heads.

 C. Hats stop cold from entering their bodies through their heads.

 D. Hats slow down cold from entering their bodies through their heads.

15. What causes a blue block to appear blue in the sunlight?

 A. The block absorbs all blue light.

 B. The block bends (refracts) all blue light.

 C. Only blue light is reflected by the block.

 D. Only blue light passes through the block.

16. Three metal cubes are heated to the temperatures shown and placed in contact with one another on a

 non-conducting surface. The picture below shows the cubes next to one another and their temperatures.

 

 In which direction does thermal energy begin to flow between the metal cubes?

 

 

17. A student has a glass of water as shown. She takes an ice cube from the freezer. She puts the ice cube in

 the water.



 Which explains what happens?

 A. The ice cube melts because cold flows out of the ice cube to the water.

 B. The ice cube does not melt because cold flows into the ice cube from the water.

 C. The ice cube melts because thermal energy transfers to the ice cube from the water.

 D. The ice cube does not melt because thermal energy transfers to the ice cube from the water.

18. An air hose extends above and below the surface of the water.



 Which statement explains why the air hose looks broken at the surface of the water?

 A. Light is refracted as it moves from air to water.

 B. Light is reflected as it moves from air to water.

 C. Light is absorbed as it moves from air to water.

 D. Light is destroyed as it moves from air to water.