Student's Name _____
THINKING WITH SCIENCE
Observation Quiz
Lesson 11 (The Changing Board)

1. Which of the following is not a simple machine?
   A. lever
   B. gear
   C. pulley
   D. hammer

2. A machine is a device that is designed to make _____ easier.
   A. work
   B. effort
   C. mechanical advantage
   D. fulcum

3. An example of the inclined plane is the:
   A. hammer
   B. wedge
   C. teeter-totter
   D. all of the above

4. The place where a lever is attached is called what?
   A. gear
   B. fulcrum
   C. balance
   D. none of the above

5. On most teeter-totters, the ____ is in the middle.
   A. balance
   B. end
   C. fulcrum
   D. point

6. The thing that you are trying to lift with a lever is called what?
   A. work
   B. effort
   C. fulcrum
   D. all of the above

7. The mechanical advantage can be defined as what?
   A. work divided by effort
   B. fulcrum times effort
   C. fulcrum time work
   D. balance divided by work

8. An example of when the mechanical advantage would be 3 is:
   A. work 3, mechanical advantage 3.
   B. effort 3, work 1.
   C. work 3, effort 1.
   D. work 3, effort 3.

9. How did I know that the work would be 1 when the location of the fulcrum was +1, +2, and +3?
   A. the last nail made the work end go down.
   B. 1 always makes the work go down.
   C. 2 and 3 are more than 1.
   D. none of the above.

10. Why was the mechanical advantage 7, 15, and 25 when the work was 7, 15, and 25?
   A. because the effort was 7, 15, and 25.
   B. because the effort was always 1.
   C. both of the above.
   D. neither of the above.

11. E-7 means what?
   A. seven said "no".
   B. everybody except 7.
   C. both of the above.
   D. neither of the above.

12. Why is a machine with a mechanical advantage of 25 better than one with 15?
   A. because the work is harder.
   B. because the effort is harder.
   C. because the work is easier.
   D. because the effort is easier.

13. A simple machine would be a what?
   A. pulley
   B. car
   C. bicycle
   D. scale

14. A kind of person who can compute the mechanical advantage of a complicated machine might be who?

A. an elementary school teacher.
B. a salesman.
C. a scientist.
D. an engineer.

15. Why should you have known that if the effort was 12 when the fulcrum was on -1, it should be more than 12 when the fulcrum was on -2?

A. because "more than 12" is more than 12.
B. because there were already 12 in the effort side.
C. both A and B above.
D. neither A nor B above.

16. Why is a mechanical advantage of effort 5, work 32 equal to 0.1?

A. because 5/32 = 0.1.
B. because 5 divided by 32 = 0.1.
C. because when you divide 5 by 32, you get 0.1
D. all of the above.

17. Why should the mechanical advantage be close to 1.0 when the fulcrum is in the middle?

A. because the work and fulcrum are both 1.
B. because the work and effort are both 5.
C. because the effort and mechanical advantage are both 1.
D. because the effort and work are approximately equal.

18. Why is the mechanical advantage bigger when the fulcrum is closer to the work?

A. because the work is easier.
B. because the work is harder.
C. because the effort is harder.
D. none of the above.

19. As the fulcrum gets _____ the work, the work becomes _____.

A. farther from, easier.
B. closer to, easier.
C. closer to, harder.
D. none of the above.

20. When the would the mechanical advantage be 5?

A. when the work is 5, and the effort is 1.
B. when the work is 1000, and the effort is 200.
C. when the work is 5, and the effort is 5.
D. when the work is 200, and the effort is 200.

Students's Name Answer Key

OBSERVATION QUIZ FOR "THINKING WITH SCIENCE"

Quiz for Lesson 11 Quiz Number _____

1. A B C **D** E
2. **A** B C D E
3. A **B** C D E
4. A **B** C D E
5. A B **C** D E
6. **A** B C D E
7. **A** B C D E
8. A B **C** D E
9. **A** B C D E
10. A **B** C D E
11. A **B** C D E
12. A B **C** D E
13. **A** B C D E
14. A B C **D** E
15. A B **C** D E
16. A B C **D** E
17. A B C **D** E
18. **A** B C D E
19. A **B** C D E
20. A **B** C D E

Student's Name _____

THINKING WITH SCIENCE
Observation Quiz
Lesson 12 (The Pale Leaf)

1. The fact that Leaf B is pale is a:
   A. manipulated variable
   B. result
   C. controlled variable
   D. none of the above

2. Why aren't the leaves the manipulated variable?
   A. because they are the same
   B. because they are not both green
   C. because they come from the same plant
   D. all of the above

3. What is one word that names the manipulated variable?
   A. leaf
   B. liquid
   C. water
   D. jar

4. How do you know that the jar lids aren't the manipulated variable?
   A. because they are both the same
   B. because they are both yellow
   C. because they are both on the jars
   D. none of the above

5. What is the largest number of manipulated variables an experiment should include?
   A. 1
   B. 2
   C. 3
   D. there is no limit.

6. What is the largest number of controlled variables that an experiment should include?
   A. 1
   B. 5
   C. 12
   D. there is no limit

7. The control question for "Does A contain any water?" would be:
   A. does A contain only water?
   B. does A contain anything else?
   C. does B contain any alcohol?
   D. Does B contain any water?

8. The word "tentative", when used to describe a conclusion, means:
   A. temporary
   B. not final
   C. not finished
   D. all of the above

9. If a conclusion is supported by the data, and not refuted by the data, it can be called:
   A. final
   B. reliable
   C. inconclusive
   D. none of the above

10. How do you know that water doesn't dissolve chlorophyll?
   A. because chlorophyll is green
   B. because Liquid A isn't green
   C. because Liquid A contains only water
   D. all of the above

11. Why did the lady's plant turn brown?
   A. because alcohol dissolves chlorophyll
   B. because people poured their cocktails in her flower pot
   C. because alcohol is not good for plants
   D. all of the above

12. The steps in the scientific method include:
   A. forming a hypothesis and drawing a conclusion
   B. forming a hypothesis, gathering data, and drawing a conclusion
   C. gathering data and forming a hypothesis
   D. all of the above.

13. The outermost layer of a geranium leaf cell is called the:
   A. cell wall
   B. cell membrane
   C. nucleus
   D. none of the above.

14. The best tree for making paper in Washington is the:
    A. fir
    B. hemlock
    C. cottonwood
    D. cedar

15. How does a pulp mill make white paper from brown pulp:
    A. they grind it up
    B. they bleach it
    C. they dry it
    D. they squeeze the water out of it

16. What word describes how a pulp mill smells?
    A. stink
    B. sweet
    C. sour
    D. all of the above

17. What kind of alcohol is in wine and beer?
    A. ethyl
    B. methyl
    C. isopropyl
    D. butyl

18. What living organism can make ethyl alcohol:
    A. bacteria
    B. mold
    C. yeast
    D. mushrooms

19. To say that the brain damaging effects of all alcohols is "cumulative" means:
    A. they all damage brain cells
    B. any brain cells killed by alcohol are not gotten back
    C. they cloud the brain
    D. all of the above.

20. One of the first signs of alcohol damage to brain cells is:
    A. nervousness
    B. trembling
    C. memory loss
    D. bleeding

Students's Name Answer Key

OBSERVATION QUIZ FOR "THINKING WITH SCIENCE"

Quiz for Lesson 12 Quiz Number _____

1. A **B** C D E
2. **A** B C D E
3. A **B** C D E
4. **A** B C D E
5. **A** B C D E
6. A B C **D** E
7. A B C **D** E
8. A B C **D** E
9. A **B** C D E
10. A B C **D** E
11. A B C **D** E
12. A **B** C D E
13. **A** B C D E
14. A B **C** D E
15. A **B** C D E
16. **A** B C D E
17. **A** B C D E
18. A B **C** D E
19. A **B** C D E
20. A B **C** D E

Student's Name _____

THINKING WITH SCIENCE

Observation Quiz

Lesson 13 (The Volcano)

1. Why is this focus called "The Volcano"?
   A. It explodes.
   B. The red rises like a volcano.
   C. The green doesn't explode.
   D. The green flows like lava.

2. How did we know that the red was less dense than the colorless?
   A. It rises.
   B. It's red.
   C. It looks hot.
   D. The colorless had no color.

3. How did we find out that the green was more dense than the colorless?
   A. We noticed that it was green.
   B. We noticed that it looked cold.
   C. We turned it over.
   D. We examined it in the bottle.

4. What word does an experimentation question always start with?
   A. Only
   B. Does
   C. If
   D. When

5. The word "tentative" to describe a conclusion means what?
   A. Temporary.
   B. Complete.
   C. Long.
   D. Short.

6. If a conclusion can be called "good", that means:
   A. It is temporary.
   B. It tells you how to set up the focus.
   C. It isn't final.
   D. It isn't complete.

7. The control question for "Does the red contain any water?" would be:
   A. Does the red contain only water?
   B. Does the green contain only water?
   C. Does the red contain any food coloring?
   D. Does the green contain any water?

8. Why do we program our space probes to look for water on other planets?
   A. We want to know whether there could be life there.
   B. We want to know whether humans could survive there.
   C. We want to know whether there is any hydrogen there.
   D. We want to know whether there would be water to drink if we went there.

9. How did we find out that the red and green food colorings had the same density.
   A. We performed a mental experiment.
   B. We mentally switched the colors.
   C. We put the red in the green bottle and the green in the red bottle.
   D. All of the above.

10. A controlled variable in this experiment was:
   A. water.
   B. food coloring.
   C. identical bottles.
   D. All of the above.

11. Why did the ancient camel caravans travel so far to obtain salt?
   A. It preserves food.
   B. They had too much of it.
   C. It makes food taste better.
   D. None of the above.

12. When is something valuable?
   A. If you want it, but don't have it.
   B. When you have a lot of it.
   C. When you have it, and want more of it.
   D. None of the above.

13. A chemical name for water is:
   A. dihydrogen monoxide.
   B. CO2
   C. O2H
   D. oxygen hydride

14. Why was the green more dense than the colorless?
    A. It was green.
    B. It flowed like lava.
    C. It had more salt.
    D. It sank.

15. A comma in a sentence means that there is a:
    A. period.
    B. pause
    C. question
    D. space

16. What is a common example of density layering?
    A. fresh water floats on salt water.
    B. a good salad dressing has 4 layers.
    C. pure ocean water is found near the bottom.
    D. All of the above.

17. The big island that is just north of the Olympic Peninsula is:
    A. Whidbey
    B. Canada
    C. Sekiu
    D. Vancouver

18. Each kind of fish likes a specific:
    A. food
    B. salt content
    C. temperature
    D. All of the above.

19. If there are no salmon where your bait is located, then probably:
    A. You won't catch any salmon.
    B. No fish will strike your bait.
    C. They are somewhere else.
    D. You should reel in your line.

20. What kind of water do halibut prefer?
    A. salty
    B. very salty
    C. slightly salty
    D. fresh

Students's Name Answer Key

OBSERVATION QUIZ FOR "THINKING WITH SCIENCE"

Quiz for Lesson 13 Quiz Number _____

1. A B **C** D E
2. **A** B C D E
3. A B **C** D E
4. A B **C** D E
5. **A** B C D E
6. A **B** C D E
7. A B C **D** E
8. **A** B C D E
9. A B C **D** E
10. A B C **D** E
11. A B **C** D E
12. **A** B C D E
13. **A** B C D E
14. A B **C** D E
15. A **B** C D E
16. A B C **D** E
17. A B C **D** E
18. A **B** C D E
19. **A** B C D E
20. A **B** C D E

Student's Name _____

THINKING WITH SCIENCE

Observation Quiz

Lesson 14 (The Collapsing Can)

1. The manipulated variable in this experiment was:
   - A. pressure
   - B. water
   - C. the cans
   - D. density

2. If there is more than 1 manipulated variable in an experiment, then you can't tell:
   - A. What caused the result.
   - B. What the controlled variables are.
   - C. How to set it up.
   - D. All of the above.

3. A condition that tells you whether a conclusion is reliable and valid is:
   - A. Whether is it supported by the data.
   - B. Whether it is refuted by the data.
   - C. Neither of the above.
   - D. Both of the above.,

4. After steam was seen coming out of can B, the next step was to:
   - A. Put the cap on.
   - B. Take it off the hotplate.
   - C. Let it cool.
   - D. None of the above.

5. What is the reason for wearing goggles during this experiment:
   - A. The light is blinding.
   - B. Steam could scald your hands.
   - C. You could be blinded if it exploded.
   - D. None of the above.

6. How long should you cool the cans?
   - A. Until they are not warm.
   - B. Until B is dented.
   - C. Until A expands.
   - D. Until no steam is coming out.

7. When air is heated, it:
   A. collapses.
   B. turns into steam.
   C. contracts.
   D. expands.

8. Air pressure at sea level is:
   A. 14 ppsi
   B. 12 ppsi
   C. 0 ppsi
   D. none of the above.

9. A space with nothing in it is:
   A. a vacuum
   B. empty
   C. found to have 0 ppsi
   D. All of the above.

10. When you cool steam, it:
   A. condenses.
   B. turns into liquid water.
   C. contracts.
   D. All of the above.

11. The primary cause of can B collapsing was:
   A. pressure
   B. density
   C. sucking
   D. expanding

12. How much does a column of air weigh if it is 63 miles deep and one square inch across?
   A. 0 pounds.
   B. 63 pounds.
   C. 14 pounds.
   D. nothing.

13. The thick suits that the astronauts wear on space walks are mainly for the purpose of:
   A. keeping warm.
   B. keeping dry.
   C. keeping the right air pressure.
   D. keeping them from floating into space.

14. The main reason why everyone in a plane flying at 35,000 feet would die if a bullet puncture the cabin would be:

A. The cabin pressure would go down.
B. They would freeze to death.
C. They couldn't get enough oxygen.
D. All of the above.

15. Why are terrorists so dangerous?

A. They don't care whether they die.
B. They are religious fanatics.
C. They are determined.
D. All of the above.

16. The Eustachian tube connects:

A. the outer each with the middle ear.
B. the inner ear with the middle ear.
C. the middle ear with the throat.
D. the inner ear with the throat.

17. You don't hear very well if;

A. the eardrum is tight.
B. the pressure on the eardrum is unequal on the inside and outside.
C. your Eustachian tube is plugged with mucus.
D. All of the above.

18. If you put the cap on a plastic water bottle, and then take it high in the mountains, it will:

A. collapse.
B. expand.
C. break.
D. get smaller.

19. The "tennis shoe bomber" had enough plastic explosives in his shoe to:

A. blow up the plane.
B. cause a hole in the side of the plane.
C. kill everyone seated around him.
D. kill himself.

20. Why were cans A and B heated for the same amount of time?

A. so there wouldn't be 2 manipulated variables.
B. because it had to be a controlled variable.
C. both of the above.
D. neither of the above.

Students's Name ANSWER Key

OBSERVATION QUIZ FOR "THINKING WITH SCIENCE"

Quiz for Lesson 14 Quiz Number _____

1. A **(B)** C D E
2. **(A)** B C D E
3. A B C **(D)** E
4. **(A)** B C D E
5. A B **(C)** D E
6. A **(B)** C D E
7. A B C **(D)** E
8. **(A)** B C D E
9. A B C **(D)** E
10. A B C **(D)** E
11. A **(B)** C D E
12. A B **(C)** D E
13. A B **(C)** D E
14. **(A)** B C D E
15. **(A)** B C D E
16. A B **(C)** D E
17. A B C **(D)** E
18. A **(B)** C D E
19. A **(B)** C D E
20. A B **(C)** D E

Student's Name _____
THINKING WITH SCIENCE
Observation Quiz
Lesson 15 (Acceleration)

1. To accelerate means:
   A. to go ahead.
   B. to speed up.
   C. to stop.
   D. to continue.

2. When you look at the data chart and see that the cart went the following distances, (A=78, B=69, C=57), you know that:
   A. A went the farthest and C went the shortest distance.
   B. A was heaviest.
   C. C was lightest.
   D. C was heaviest.

3. If a conclusion is refuted, it is:
   A. supported..
   B. not supported.
   C. proved false.
   D. proved true.

4. If a conclusion can be said to be supported and not refuted, it can be called:
   A. reliable.
   B. valid.
   C. both of the above.
   D. neither of the above.

5. In this experiment, the manipulated variable is:
   A. weight
   B. each sinker
   C. distance
   D. cargo A

6. Why do all of the sinkers have to be the same size?
   A. Otherwise, there would not be a manipulated variable.
   B. Otherwise, there would be two manipulated variables.
   C. Otherwise, the cargoes would all go the same distance.
   D. Otherwise, there would be no controlled variables.

7. What is one of the primary reasons for scientific experimentation?
   A. To determine the effects of the manipulated variable.
   B. To determine the effects of a controlled variable.
   C. To determine how weight affects travel.
   D. To determine how distance affects travel.

8. The phrase "E-7" means:
   A. Number 7 is excellent.
   B. Number 7 is not good.
   C. everybody except 7.
   D. 7 people are wrong.

9. Scientists analyze data charts in order to:
   A. determine results.
   B. make predictions.
   C. neither of the above.
   D. both of the above.

10. What slows down moving objects?
   A. weight.
   B. sinkers.
   C. heat.
   D. friction.

11. An object that is in motion will stay in motion unless it encounters what?
   A. a brick wall.
   B. heat.
   C. gravity.
   D. friction.

12. In this focus, the friction is between:
   A. the table and the wheels.
   B. the rubber band and the cart.
   C. the wheels and the cart.
   D. the cart and the launch pad.

13. Something that has apparently been moving forever, and which will apparently continue to move forever because it encounters no friction is:
   A. a satellite.
   B. the moon.
   C. the earth.
   D. all of the above.

14. How deep is the atmosphere?
    A. 72 miles.
    B. 63 miles.
    C. 18,000 miles.
    D. none of the above.

15. The first artificial satellite was launched in:
    A. 1930
    B. 1957
    C. 1962
    D. none of the above.

16. The opposite force to gravity, that must be balanced with gravity in order for a satellite to stay in orbit, is:
    A. centrifugal
    B. gravitational
    C. spinning
    D. air

17. Why couldn't Albert Einstein launch a satellite into orbit?
    A. He didn't know how.
    B. He didn't have a rocket that could go 18,000 miles per hour.
    C. He didn't know how to make a satellite.
    D. He didn't have a launch pad.

18. A law of physics states that "For every action, there an equal and opposite what?
    A. action
    B reaction
    C. force
    D. gravity

19. Without computers, what couldn't we do?
    A. make the space shuttle land where we want it to land.
    B. Turn on the retrorockets of the shuttle at the correct time.
    C. Turn off the retrorockets of the shuttle at the correct time.
    D. all of the above.

20. If an independent truck driver is asked to haul a load of lumber, what is the first question he will ask the shipper?
    A. How heavy is the load?
    B. What is in the load?
    C. How fast do you want to get it to the destination?
    D. None of the above.

Students's Name ANSWER Key

OBSERVATION QUIZ FOR "THINKING WITH SCIENCE"

Quiz for Lesson 15 Quiz Number _____

1. A **B** C D E
2. **A** B C D E
3. A B **C** D E
4. A B **C** D E
5. **A** B C D E
6. A **B** C D E
7. **A** B C D E
8. A B **C** D E
9. A B C **D** E
10. A B C **D** E
11. A B C **D** E
12. **A** B C D E
13. A B C **D** E
14. A **B** C D E
15. A **B** C D E
16. **A** B C D E
17. A **B** C D E
18. A **B** C D E
19. A B C **D** E
20. **A** B C D E

Student's Name _____

THINKING WITH SCIENCE

Observation Quiz

Lesson 16 (The Crystals)

1. Two ways that crystals form are:
   A. cooling and heating of lava.
   B. cooling of lava and heating of water.
   C. heating of lava and cooling of water.
   D. cooling of lava and evaporation of water solutions.

2. The slower that the process of crystal formation occurs:
   A. the bigger the crystals are.
   B. the more colorful the crystals are.
   C. the more crystals there are.
   D. all of the above.

3. A good place to find crystals is:
   A. on a beach.
   B. in the gravel of a dry stream bed.
   C. at the bottom of a lake.
   D. on a mountain top.

4. Why did the experiment use 3 identical bowls?
   A. It was a controlled variable.
   B. So that you could see through them.
   C. They were all that were available.
   D. All of the above.

5. In this focus, the manipulated variable was:
   A. the kind of water.
   B. water
   C. the way the crystals formed.
   D. the size of the crystals.

6. A controlled variable in this focus was:
   A. water
   B. bowls
   C. temperature
   D. all of the above.

7. What happened to the water that was originally in the bowls?

A. It condensed.
B. It got hot.
C. It froze.
D. It evaporated.

8. When small amounts of salts are present in tap water, what do we call them?

A. ions
B. molecules
C. minerals
D. abundant

9. When water evaporates, what is left behind?

A. everything that was in it.
B. mud.
C. sodium chloride.
D. potassium sulfate.

10. When we turn a liquid into a gas, and then turn the gas back into a liquid, the process is called:

A. boiling
B. freezing
C. distilling
D. purifying

11. If you distill water, how long do you have to heat it?

A. until it forms crystals.
B. until it boils.
C. until it forms a solid.
D. until it disappears.

12. Which of the following substances can be purified by distilling?

A. gasoline
B. water
C. alcohol
D. all of the above.

13. Which of the following salts is found in sea water?

A. sodium chloride.
B. potassium nitrate.
C. iron sulfide.
D. all of the above.

14. What color are most iron salts?
    A. white
    B. yellow
    C. red
    D. brown

15. The common name of iron oxide is:
    A. salt
    B. rust
    C. ox iron
    D. copper sulfate

16. What color are most salts?
    A. white
    B. yellow
    C. red
    D. brown

17. Where would be a good place to find water containing a lot of iron?
    A. a hot spring
    B. a river
    C. a lake
    D. city water

18. Water flowing through cracks in a mountain can form:
    A. rivers
    B. creeks
    C. hot springs
    D. pools

19. Why can you get too much mineral water?
    A. if that's all you drink for 7 or more days.
    B. it builds up in your intestine.
    C. it can kill the lining of your intestine if it builds up.
    D. all of the above.

20. Why is it all right to drink sea water for up to 3 days?
    A. that much won't harm you.
    B. that much won't kill the lining of your intestine.
    C. it takes 7 days of drinking sea water to harm you.
    D. all of the above.

Students's Name ANSWER KEY

OBSERVATION QUIZ FOR "THINKING WITH SCIENCE"

Quiz for Lesson 16 Quiz Number _____

1.	A	B	C	**D**	E
2.	**A**	B	C	D	E
3.	A	**B**	C	D	E
4.	**A**	B	C	D	E
5.	**A**	B	C	D	E
6.	A	B	C	**D**	E
7.	A	B	C	**D**	E
8.	A	B	**C**	D	E
9.	**A**	B	C	D	E
10.	A	B	**C**	D	E
11.	A	**B**	C	D	E
12.	A	B	C	**D**	E
13.	A	B	C	**D**	E
14.	A	B	C	**D**	E
15.	A	**B**	C	D	E
16.	**A**	B	C	D	E
17.	**A**	B	C	D	E
18.	A	B	**C**	D	E
19.	A	B	C	**D**	E
20.	A	B	C	**D**	E

Student's Name _____

THINKING WITH SCIENCE

Observation Quiz

Lesson 17 (The Changing Weight)

1. The difference in the weights in trials A,B,C and D is caused by:
   A. the sinkers
   B. the fluids
   C. the nails
   D. the scale

2. All liquids and gases can be called:
   A. substances
   B. fluids
   C. neither of the above
   D. both of the above

3. Why is the scale called a "reverse" scale?
   A. because the numbers on it are reversed.
   B. because you have to add nails to cup A.
   C. because you have to subtract nails from 600.
   D. all of the above.

4. How could you easily tell that the sinker weighed less in B than in A?
   A. the A end of the scale was up before more nails were added.
   B. it took more nails to make the scale go down with B.
   C. both of the above.
   D. neither of the above.

5. The manipulated variable in this focus was:
   A. the fluids
   B. the jars
   C. the sinker
   D. none of the above.

6. Which of the following is not a state of matter?
   A. solid
   B. gas
   C. plasma
   D. liquid

7. Which of the following is not one of the three main components of air?
   A. carbon monoxide
   B. nitrogen
   C. oxygen
   D. carbon dioxide

8. What is the most abundant gas in air?
   A. oxygen
   B. nitrogen
   C. carbon dioxide
   D. carbon monoxide

9. Which of the following would kill you if you drank a cupful?
   A. hydrochloric acid
   B. rubbing alcohol
   C. Clorox
   D. all of the above.

10. What do we program our space probes to look for on other planets?
   A. rocks
   B. mercury
   C. oxygen
   D. water

11. Which of the following does Drano not dissolve?
   A. protein
   B. carbohydrate
   C. fat
   D. all of the above.

12. Why is a "trap" required in all drain pipes?
   A. to keep mice out.
   B. to keep sewer gases out.
   C. to keep rats out.
   D. to keep water out.

13. The main difference between fluids A,B,C and D that caused the different weights is:
   A. evaporation
   B. thickness
   C. density
   D. weight

14. If a conclusion is supported by the data and not refuted by the data, we can call it:
    A. reliable
    B. tentative
    C. complete
    D. final

15. Eggs float in:
    A. tap water
    B. alcohol
    C. salt water
    D. all of the above.

16. Things weigh more in fluids that are less:
    A. dense
    B. thick
    C. heavy
    D. clear

17. Why do air bubbles go upward in any liquid?
    A. they like to float.
    B. they have less gravity.
    C. they are less dense.
    D. liquids are dense.

18. Why did the test subject weigh only 5 pounds after 1 hour in Lake Drano?
    A. because Lake Drano was more dense.
    B. because Lake Drano dissolved everything except his skeleton.
    C. because Drano doesn't dissolve carbohydrates.
    D. because he was not cooperative.

19. Why did the test subject weigh less in Puget Sound than in Clear Lake?
    A. Puget Sound is salty.
    B. Clear lake is fresh water.
    C. Puget Sound is more dense than Clear Lake.
    D. all of the above.

20. To "refute" a conclusion means:
    A. to prove it true.
    B. to prove it false.
    C. to confirm it.
    D. to change it.

Students's Name Answer Key

OBSERVATION QUIZ FOR "THINKING WITH SCIENCE"

Quiz for Lesson 17 Quiz Number _____

1. A **B** C D E
2. A B C **D** E
3. A B **C** D E
4. A B **C** D E
5. **A** B C D E
6. A B **C** D E
7. **A** B C D E
8. A **B** C D E
9. A B C **D** E
10. A B C **D** E
11. A **B** C D E
12. A **B** C D E
13. A B **C** D E
14. **A** B C D E
15. A B **C** D E
16. **A** B C D E
17. A B **C** D E
18. A **B** C D E
19. A B C **D** E
20. A **B** C D E

Student's Name _____

THINKING WITH SCIENCE

Observation Quiz

Lesson 18 (The Thermometers)

1. Fluids include:
   A. solids, liquids and gases.
   B. solids and liquids.
   C. liquids and gases.
   D. iron oxide.

2. In this experiment, the Zero time was the time:
   A. before dipping the thermometers in the fluids.
   B. before opening the jars.
   C. before reading the thermometers.
   D. all of the above.

3. At the Zero time, why did all of the thermometers read "70 degrees?
   A. they were not yet dipped.
   B. they were measuring the air temperature of the room.
   C. both of the above.
   D. neither of the above.

4. The manipulated variable in this focus was:
   A. the jars.
   B. the thermometers.
   C. the lids.
   D. the fluids.

5. Which of the following was not a controlled variable in this focus?
   A. jars.
   B. lids.
   C. thermometers.
   D. none of the above.

6. Why should you have known from the predicted results for 15 minutes that C contained air?
   A. It never changed.
   B. It stayed at 70 degrees.
   C. The jar had been opened.
   D. all of the above.

7. Why should no one have raised their hand with a guess when I described Fluid A as a clear, colorless liquid?
   A. There are over 100 clear, colorless liquids.
   B. all liquids are clear and colorless.
   C. all liquids are clear.
   D. none of the above.

8. Why do we look for water on other planets?
   A. it would indicate the possibility of life.
   B. it would mean that we would be able to drink it.
   C. it would mean that there were oceans at one time.
   D. none of the above.

9. If a conclusion is "reliable", that means that it is:
   A. final
   B. tentative
   C. supported
   D. refuted

10. The important difference between the fluids in Jars A, B, and C was:
   A. weight
   B density
   C. evaporation rate
   D. exchange rate

11. When a liquid changes to a gas, that process is called:
   A. evaporation
   B. crystallization
   C. freezing
   D. condensation

12. A familiar example of evaporation is when:
   A. liquid water changes to solid water.
   B. liquid water changes to steam
   C. solid water changes to a gas
   D. solid water melts

13. A liquid absorbs what when it evaporates?
   A. air
   B. oxygen
   C. heat
   D. light

14. After you get out of the water, you stop feeling cold when:
    A. you are dry.
    B. the water stops absorbing heat.
    C. there is no more water to evaporate.
    D. all of the above.

15. Why doesn't air evaporate?
    A. because it's not a liquid.
    B. because it's already a gas.
    C. both of the above.
    D. neither of the above.

16. When a liquid evaporates faster, it absorbs more:
    A. light
    B. air
    C. heat
    D. gas

17. Why does a drop of nail polish remover disappear faster than a drop of water?
    A. it is thinner.
    B. it evaporates faster.
    C. it isn't as dense.
    D. none of the above.

18. Which of these fluids would feel warmest if you put a drop on your skin?
    A. oil
    B. nail polish remover
    C. alcohol
    D. water

19. Where is a universal law true?
    A. everywhere on earth.
    B. everywhere in the solar system.
    C. everywhere in the universe.
    D. all of the above.

20 Why does nail polish remover feel the coldest on your skin?
    A. it is less dense.
    B. it evaporates fastest.
    C. it is thinner.
    D. all of the above.

Students's Name Answer Key

OBSERVATION QUIZ FOR "THINKING WITH SCIENCE"

Quiz for Lesson 18 Quiz Number _____

1.	A	B	**C**	D	E
2.	**A**	B	C	D	E
3.	A	B	**C**	D	E
4.	A	B	C	**D**	E
5.	A	B	C	**D**	E
6.	A	B	C	**D**	E
7.	**A**	B	C	D	E
8.	**A**	B	C	D	E
9.	A	B	**C**	D	E
10.	A	B	**C**	D	E
11.	**A**	B	C	D	E
12.	A	**B**	C	D	E
13.	A	B	**C**	D	E
14.	A	B	C	**D**	E
15.	A	B	**C**	D	E
16.	A	B	**C**	D	E
17.	A	**B**	C	D	E
18.	**A**	B	C	D	E
19.	A	B	C	**D**	E
20.	A	**B**	C	D	E

Student's Name _____
THINKING WITH SCIENCE
Observation Quiz
Lesson 19 (The Magic Balloon)

1. How did you know that the contents of the balloon bottle wasn't a liquid or solid?
   A. It was clear.
   B. It was colorless.
   C. You couldn't see it.
   D. It wasn't thick.

2. Which of the following combinations describes air?
   A. 70% nitrogen, 29 % oxygen, 1 % carbon dioxide.
   B. 99% oxygen, 1 % carbon dioxide.
   C. 1 % nitrogen, 1 % carbon dioxide, 98% oxygen.
   D. 20 % carbon dioxide, 20 % nitrogen, 60% oxygen.

3. For the question, "Does A contain any water?", the control question would be:
   A. Does A contain only water?
   B. Does B contain any water?
   C. Does A contain any food coloring?
   D. Is the food coloring in A red?

4. The fact that there is water in both A and B makes that what kind of variable?
   A. manipulated
   B. experimental
   C. reliable
   D. controlled

5. A conclusion that is supported by the data, but not refuted by the data can be called what?
   A. final
   B. reliable
   C. complete
   D. controlled

6. Why does the balloon inflate when the bottle is put into hot water?
   A. The air in the bottle rises.
   B. The air in the bottle condenses.
   C. The air in the bottle expands.
   D. The bottle expands.

7. What does air do when it is heated?
   A. rises.
   B. expands.
   C. both of the above.
   D. neither of the above.

8. When you cool air, what does it do?
   A. contract
   B. condense
   C. compress
   D. conclude

9. When you get more supporting data for a conclusion, what should you do to it?
   A. shorten it
   B. finalize it
   C. add to it
   D. refute it

10. Because the air in the bottle expands, the balloon does what?
   A. expand
   B. inflate
   C. deflate
   D. collapse

11. What expands when heated?
   A. carbon dioxide
   B. propane
   C. nitrogen
   D. all gases

12. Where is a universal law always true?
   A. Earth
   B. Mars
   C. Milky Way Galaxy
   D. all of the above.

13. What is a very common example of the fact that air expands when you heat it?
   A. soda pop fizzing
   B. a food can gushing when you open it
   C. a balloon popping when it is filled too much
   D. a hot air balloon

14. If 10 pounds of air that occupies 100 cubic feet of space is heated until it expands to fill 200 cubic feet of space, what happens to its density?

A.2 times as dense
B. 200 times as dense
C. half as dense
D. one-fourth as dense

15. What rises?

A. less dense fluids in more dense fluids.
B. hot water in cold water.
C. hot fluids in cold fluids of the same type.
D. all of the above.

16. Why is the statement, "Heat rises" not true?

A. heat sinks
B. heat doesn't rise.
C. heat is energy.
D. heat is matter.

17. What does the hot air balloon pilot do to make the balloon go higher?

A. tosses off some sandbags
B. closes the opening
C. turns on the torch
D. none of the above.

18. How does the pilot make the balloon go down?

A. lets some of the air out.
B. turns off the torch.
C. opens the top.
D. none of the above.

19. Why does a warm basketball bounce better than the same basketball when it is cold?

A. the air expands when it is warm.
B. the basketball gets firmer when it is warm.
C. a firm basketball bounces better than a soft basketball.
D. all of the above.

20 What is the air pressure all around the earth at sea level?

A. 14 ppsi
B. 24 ppsi
C. 63 ppsi
D. 32 ppsi

Students's Name ANSWER Key

OBSERVATION QUIZ FOR "THINKING WITH SCIENCE"

Quiz for Lesson 19 Quiz Number _____

1. A B **C** D E
2. **A** B C D E
3. A **B** C D E
4. A B C **D** E
5. A **B** C D E
6. A B **C** D E
7. A B **C** D E
8. **A** B C D E
9. A B **C** D E
10. A **B** C D E
11. A B C **D** E
12. A B C **D** E
13. A B C **D** E
14. A B **C** D E
15. A B C **D** E
16. A **B** C D E
17. A B **C** D E
18. A **B** C D E
19. A B C **D** E
20. **A** B C D E

Student's Name _____

THINKING WITH SCIENCE

Observation Quiz

Lesson 20 (Volcano 2)

1. How do we know that the red is less dense than the colorless?
   A. because it is red.
   B. because it rises.
   C. because it is colored.
   D. because it doesn't sink.

2. How did we find out that the green was more dense?
   A. we turned it over.
   B. we put red food coloring into it.
   C. it didn't rise.
   D. none of the above.

3. An experimentation question always begins with what word?
   A. does
   B. only
   C. if
   D. why

4. How did we know the green was more dense.
   A. it was green
   B. it sank
   C. it was colored
   D. none of the above

5. A conclusion can be called "reliable" if what is true?
   A. it is supported by the data.
   B. it is not refuted by the data
   C. neither of the above.
   D. both of the above.

6. The control question for "Does the red contain any water?" is:
   A. Does the red contain only water?
   B. Does the green contain any water?
   C. Both of the above.
   D. neither of the above.

7. What word best fits in the following blank: "Does the red contain ____ food coloring and water?"

A. red
B. only
C. pure
D. none of the above

8. How did we find out that the red and green food coloring had the same density?

A. We put some red food coloring in the colorless.
B. We put some green food coloring in the colorless
C. We switched the food coloring mentally.
D. We weighed them.

9. What did the two experiments prove?

A. the density of the red and green food coloring was the same.
B. the food coloring didn't affect the results.
C. the food coloring didn't matter.
D. all of the above.

10. What do we program our space probes to look for on other planets?

A. food coloring
B. water
C. rocks
D. oxygen

11. If you get 3 containers of water from the same faucet, and they are different in one way, what would that way be?

A. temperature
B. minerals
C. salts
D. color

12. When the word "medium" is used in a sentence, it usually means what?

A. in the middle
B. not hot and not cold
C. all the way
D. scarce

13. Where do hot fluids rise?

A. In cold substances.
B. In cold fluids of the same type.
C. In cold water
D. In cold mercury

14. When does heat rise?

A. always
B. sometimes
C. when the surrounding air is cold
D. never

15. When you are talking about hot fluids rising in cold fluids, why do you have to add the phrase "of the same type"?

A. because some fluids are more dense than other fluids.
B. because no two substances have the same density.
C. because solids don't rise in fluids.
D. none of the above.

16. Why doesn't the rule about hot substances rising in cold substances not apply to solids?

A. solids can't flow.
B. solids are too dense.
C. solids aren't dense enough.
D. none of the above

Students's Name Answer Key

OBSERVATION QUIZ FOR "THINKING WITH SCIENCE"

Quiz for Lesson 20 Quiz Number _____

1. A **B** C D E
2. **A** B C D E
3. A B **C** D E
4. A **B** C D E
5. A B C **D** E
6. A **B** C D E
7. A **B** C D E
8. A B **C** D E
9. A B C **D** E
10. A **B** C D E
11. **A** B C D E
12. **A** B C D E
13. A **B** C D E
14. A B C **D** E
15. **A** B C D E
16. **A** B C D E
17. A B C D E
18. A B C D E
19. A B C D E
20. A B C D E