

STAAR CONNECTION™ Developmental Series™

Science
5
teacher

(revised for streamlined TEKS)



KAMICO®
Instructional Media, Inc.

STAAR CONNECTION™

Science
5
teacher

Developmental Series™

VI/iii/MMXVIII

Version 2

(revised for streamlined TEKS)



KAMICO®

Instructional Media, Inc.

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KAMICO® Instructional Media, Inc.
STAAR CONNECTION™
Introduction

KAMICO® Instructional Media's program is validated by scientifically based research. **STAAR CONNECTION™ Diagnostic Series™** and **Developmental Series™** can be used in tandem to ensure mastery of Texas reporting categories and TEKS. The *Diagnostic Series™* consists of a bank of assessments. Each assessment covers a mixture of reporting categories and TEKS. This research-based format provides continual reinforcement for and ensures retention of mastered concepts. To take full advantage of this series, administer an assessment to students. After they have completed the assessment, use it as an instructional tool. Go over each item with the class, discussing all correct and incorrect answers. Then, use the assessment as a diagnostic tool to determine a standard for which students need remediation. Find that standard in the *Developmental Series™*.

Each book in the *STAAR CONNECTION Developmental Series™* consists of isolated activities and assessments to allow for the development of specific TEKS. For every TEKS, there is at least one individual or group activity. The activities provide a fun, challenging, yet nonthreatening, way to develop mastery of the TEKS. In addition to these activities, each *Developmental Series™* book has assessments on isolated standards to be used to identify mastery or the need for further skill development or reinforcement. Continue to alternate between the *STAAR CONNECTION™ Diagnostic Series™* and the *Developmental Series™*.

KAMICO's **DATA CONNECTION®** software prints student answer sheets on plain paper using a standard laser printer, scans answer sheets using a TWAIN-compliant scanner, scores assessments, and disaggregates student academic data, showing which goals and objectives are mastered and which goals and objectives are in need of reinforcement. The software is preprogrammed to work with all KAMICO® assessments. It is easily customized to work with other instructional materials and assessments as well as teacher-, school-, district-, or state-created assessments. **DATA CONNECTION®** analyzes academic data from individual students, classes, grade levels, and demographic groups. Reports are presented in tabular and graphic form. Item analysis is provided to help determine the most effective method of instruction.

KAMICO® Instructional Media, Inc., supports efforts to ensure adequate yearly progress and eliminate surprises in high-stakes test results.

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Texas Essential Knowledge and Skills
Grade 5 Science
(revised for streamlined TEKS)

Reporting Category 1:
Matter and Energy

The student will demonstrate an understanding of the properties of matter and energy and their interactions.

Grade 5

(5.5) **Matter and energy.** The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to

- (A) classify matter based on measurable, testable, and observable physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating using water as a reference point), solubility in water, and the ability to conduct or insulate thermal energy or electric energy.

Readiness Standard

Physical Fitness	15
Assessment	21

- (B) demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand and sand and water.

Supporting Standard

All Mixed Up	25
Assessment	30

- (C) identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water. ***Supporting Standard***

What's the Solution?	32
Assessment	46

Grade 3

(3.5) **Matter and energy.** The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to

- (C) predict, observe, and record changes in the state of matter caused by heating or cooling such as ice becoming liquid water, condensation forming on the outside of a glass of ice water, or liquid water being heated to the point of becoming water vapor.

Supporting Standard

What's My State?	49
Assessment	53

Reporting Category 2: Force, Motion, and Energy

The student will demonstrate an understanding of force, motion, and energy and their relationships.

Grade 5

(5.6) **Force, motion, and energy.** The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to

- (A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy. ***Readiness Standard***

Energize Your Name!	57
Assessment	58

- (B) demonstrate that the flow of electricity in closed circuits can produce light, heat, or sound. ***Readiness Standard***

Electricity Makes It Happen	60
Assessment	72

- (C) demonstrate that light travels in a straight line until it strikes an object and is reflected or travels through one medium to another and is refracted. ***Readiness Standard***

Changing Light	76
Assessment	80

(D) design a simple experimental investigation that tests the effect of force on an object. Supporting Standard	
Forced to Change	84
Assessment	90

Grade 3

(3.6) **Force, motion, and energy.** The student knows that forces cause change and that energy exists in many forms. The student is expected to

(B) demonstrate and observe how position and motion can be changed by pushing and pulling objects such as swings, balls, and wagons. Supporting Standard	
Moving To New Positions	94
Assessment	101

**Reporting Category 3:
Earth and Space**

The student will demonstrate an understanding of components, cycles, patterns, and natural events of Earth and space systems.

Grade 5

(5.7) **Earth and space.** The student knows Earth's surface is constantly changing and consists of useful resources. The student is expected to

(A) explore the processes that led to the formation of sedimentary rocks and fossil fuels. Readiness Standard	
Old Earth	105
Assessment	111
(B) recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, or ice. Readiness Standard	
Landform Jeopardy	115
Assessment	124

(5.8) Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to	
(A) differentiate between weather and climate. Supporting Standard	
	How Are They Different? 127
	Assessment 130
(B) explain how the Sun and the ocean interact in the water cycle. Supporting Standard	
	Interaction Match Game 134
	Assessment 146
(C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky. Readiness Standard	
	Follow That Sun! 149
	Assessment 154
(D) identify and compare the physical characteristics of the Sun, Earth, and Moon. Supporting Standard	
	Calling EMS 157
	Assessment 161

Grade 4

(4.7) Earth and space. The student knows that Earth consists of useful resources and its surface is constantly changing. The student is expected to	
(A) examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants. Supporting Standard	
	Getting Soiled 163
	Assessment 169
(C) identify and classify Earth's renewable resources, including air, plants, water, and animals, and nonrenewable resources, including coal, oil, and natural gas, and the importance of conservation. Supporting Standard	
	Resourceful Earth 172
	Assessment 178

(4.8) Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to	
(A) measure, record, and predict changes in weather.	
Supporting Standard	
	Tomorrow's Weather Forecast Is 181
	Assessment 185
(B) describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process. Supporting Standard	
	Moving Water 189
	Assessment 197
(C) collect and analyze data to identify sequences and predict patterns of change in shadows, seasons, and the observable appearance of the Moon over time.	
Supporting Standard	
	Pattern Play 200
	Assessment 210

Grade 3

(3.7) Earth and space. The student knows that Earth consists of natural resources and its surface is constantly changing. The student is expected to	
(B) investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides. Supporting Standard	
	Rapidly Changing Earth 214
	Assessment 222
(3.8) Earth and space. The student knows there are recognizable patterns in the natural world and among objects in the sky. The student is expected to	
(D) identify the planets in Earth's solar system and their position in relation to the Sun. Supporting Standard	
	Planet Poster 225
	Assessment 227

Reporting Category 4: Organisms and Environments

The student will demonstrate an understanding of the structures and functions of living organisms and their interdependence on each other and on their environment.

Grade 5

(5.9) **Organisms and environments.** The student knows that there are relationships, systems, and cycles within environments. The student is expected to

(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living components.

Readiness Standard

Lean on Me	230
Assessment	232

(B) describe the flow of energy within a food web, including the roles of the Sun, producers, consumers, and decomposers.

Readiness Standard

Flowing Food	236
Assessment	247

(C) predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways. ***Supporting Standard***

Before and After	251
Assessment	259

(D) identify fossils as evidence of past living organisms and the nature of the environments at the time using models.

Supporting Standard

What Happened Next	263
Assessment	269

(5.10) **Organisms and environments.** The student knows that organisms have structures and behaviors that help them survive within their environments. The student is expected to

- (A) compare the structures and functions of different species that help them live and survive in a specific environment such as hooves on prairie animals or webbed feet in aquatic animals.

Readiness Standard

Adapt to Survive	274
Assessment	278

- (B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle.

Readiness Standard

Inherited or Learned?	282
Assessment	290

Grade 3

(3.9) **Organisms and environments.** The student knows and can describe patterns, cycles, systems, and relationships within the environments. The student is expected to

- (A) observe and describe the physical characteristics of environments and how they support populations and communities of plants and animals within an ecosystem. **Supporting Standard**

Ecosystem Life Support	293
Assessment	301

(3.10) **Organisms and environments.** The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to

- (B) investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady beetles. **Supporting Standard**

Life Cycle Rummy	306
Assessment	317

Scientific Investigation and Reasoning Skills

These skills will not be listed under a separate reporting category. Instead, they will be incorporated into at least 40% of the test questions in reporting categories 1-4 and will be identified along with content standards.

Grade 5

(5.1) **Scientific investigation and reasoning.** The student conducts classroom and outdoor investigations following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to

(A) demonstrate safe practices and the use of safety equipment as outlined in Texas Education Agency-approved safety standards during classroom and outdoor investigations using safety equipment, including safety goggles or chemical splash goggles, as appropriate, and gloves, as appropriate.

Classroom and Outdoor Investigation Practices	322
Assessment	326

(B) make informed choices in the conservation, disposal, and recycling of materials.

Informed Choices in Resource Management	329
Assessment	337

(5.2) **Scientific investigation and reasoning.** The student uses scientific practices during laboratory and outdoor investigations. The student is expected to

(A) describe, plan, and implement simple experimental investigations testing one variable.

Paper Airplane Engineer	340
Assessment	345

(B) ask well defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology.

Paper Airplane Preflight Preparation	348
Assessment	350

(C)	collect and record information using detailed observations and accurate measuring.		
		Paper Airplane Test Pilot	353
		Assessment	357
(D)	analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence.		
		Paper Airplane Flight Analysis	361
		Assessment	365
(E)	demonstrate that repeated investigations may increase the reliability of results.		
		Repeating for Reliable Results	371
		Assessment	378
(F)	communicate valid conclusions in both written and verbal forms.		
		Paper Airplane Conclusions and Refinements	382
		Assessment	383
(G)	construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information.		
		Paper Airplane Graphing for Understanding	388
		Assessment	390
(5.3)	Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to		
(A)	analyze, evaluate, and critique scientific explanations by using evidence, logical reasoning, and experimental and observational testing.		
		Is That a Fact?	396
		Assessment	411
(B)	draw or develop a model that represents how something that cannot be seen such as the Sun, Earth, and Moon system and formation of sedimentary rock works or looks.		
		Ant Nest Diorama	416
		Assessment	419

(C) connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.

Science Match-Up	423
Assessment	436

(5.4) **Scientific investigation and reasoning.** The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to

collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, prisms, mirrors, balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, and notebooks; timing devices, and materials to support observations of habitats or organisms such as terrariums and aquariums.

Equipment Check	438
Assessment	440

Answer Key	445
Student Bubble Answer Sheet	459
Bubble Answer Key	463
Rulers	467
KAMICO® Product Information	468

Reporting Category 1: Matter and Energy

TEKS 5.5A

Classify matter based on measurable, testable, and observable physical properties including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating using water as a reference point), solubility in water, and the ability to conduct or insulate thermal energy or electric energy.

ACTIVITY

Physical Fitness

Materials

Physical Fitness activity sheet for each student

Assorted materials with various physical properties that will be tested, including aluminum nail, steel paper clip, rubber band, wooden ruler, plastic fork, water in a cup or graduated cylinder, and Styrofoam—7 sets

Dry cell (for continuity tester)

1.5-volt light bulb in socket (for continuity tester)

Lengths of wire (for continuity tester)—3

Lamp with an incandescent bulb

Magnet

Pan balance

Paper cups—2

Pan with water—2

Rock salt

Spoon or stick for stirring

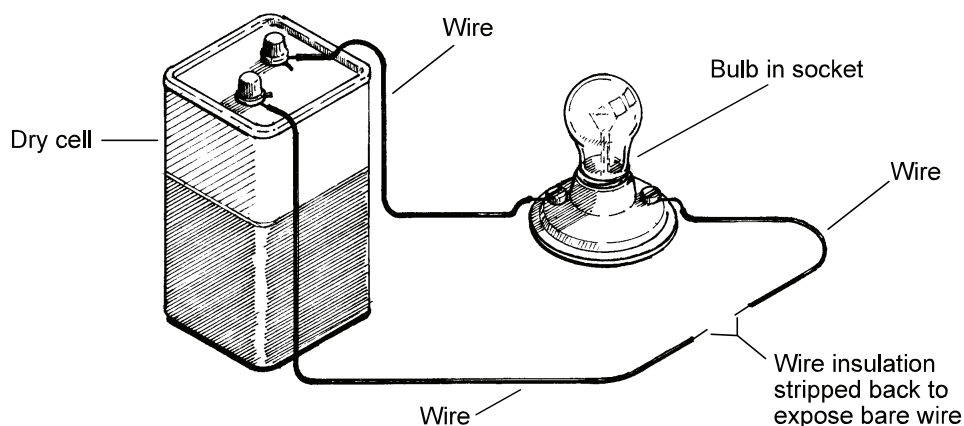
Paper towels

Background

All matter has specific physical properties. Substances may be solids, liquids, or gases. They may easily conduct heat, electricity, or sound, or they may insulate against the passage of heat, electricity, or sound. Some substances are attracted to magnets while others are not. Substances may float or sink in water and have many other properties. Matter is recognized and classified according to its physical properties.

Preparation

Assemble the continuity tester as shown.



Equip lab station 2 with the assembled continuity tester. Equip lab station 3 with a lamp. Ensure that the lamp used is provided with a bulb that produces heat (most LED or CFL bulbs do not produce enough heat for this investigation). Equip lab station 4 with a magnet. Equip lab station 5 with a pan balance, two paper cups, and rock salt. Equip lab station 6 with a pan of water. Equip lab station 7 with a pan of water, a spoon or stick for stirring, and about a cup of rock salt. Equip each station with the assorted materials to be tested. One additional lab station will be equipped with only the assorted materials to be tested and rock salt (lab station 1). If desired, to accommodate larger classes or to facilitate a quicker activity, more than one lab station can be created for each investigation.

Note: Alternatively, one lab station can be created for each lab group; in this case, each station is equipped with all of the materials described above. Each lab group would remain at its station throughout the activity instead of rotating.

Procedure

Divide the class into seven lab groups. Distribute the *Physical Fitness* activity sheet to each student. Demonstrate how to use the continuity tester. Show students that when the two free wire ends come in contact with a conductor, the bulb lights. When they come in contact with a nonconductor, the bulb does not light.

Assign each lab group to a lab station. At the lab stations, students follow the procedures outlined on their activity sheets. They test each of their assigned materials using the steps described. Point out that not all materials are tested in each lab station. As students finish, they complete their activity sheets. When students finish with an investigation, they rotate to the next lab station.

When all groups have finished, review their findings as a class.

Answer Key

Material	State of Matter			Does It Have Shape?		Electrical Conductivity		Heat Conductivity		Magnetism		Mass		Relative Density		Solubility in Water	
	Solid	Liquid	Gas	Yes	No	Conductor	Insulator	Conductor	Insulator	Yes	No	Yes	No	Floats in Water	Sinks in Water	Soluble	Not Soluble
aluminum nail	✓			✓		✓		✓			✓	✓			✓		✓
steel paper clip	✓			✓		✓		✓		✓		✓			✓		✓
wooden ruler	✓			✓			✓		✓		✓	✓		✓			✓
plastic fork	✓			✓			✓		✓		✓	✓			✓		✓
Styrofoam	✓			✓			✓		✓		✓	✓		✓			✓
rubber band	✓			✓			✓		✓		✓	✓			✓		✓
air			✓					✓									
water		✓										✓					
rock salt	✓			✓								✓				✓	

Conclusion

- 1 What do all electrical conductors have in common?
All tested electrical conductors are made of metal.
- 2 What types of matter are the best heat conductors?
The tested metals are the best heat conductors.
- 3 What is unique about the tested magnetic materials?
The tested magnetic material contains steel (or iron).

Physical Fitness Activity Sheet

Background

All of us come into contact with many different kinds of matter every day. We recognize familiar matter because of its physical properties. Matter can be a solid, liquid, or gas. Physical properties are characteristics of a substance that can be observed or measured without changing the original substance. It is helpful to classify matter based on its physical properties.

Procedure

Follow the directions to test the physical properties of the materials located at each lab station. Record your data by placing checkmarks in the appropriate columns found in the data table. If a space in a column is shaded for a material, do not conduct the physical property test on that material. Answer the conclusion questions after you collect all data.

Lab Station 1

Look at each of the materials in your lab station. Also, look at the air around you. Determine the state of matter for each material. Record the state in your data table under the column labeled "State of Matter." Then, determine whether each material has a shape. Record your observations under the column labeled "Does It Have Shape?" in your data table.

Lab Station 2

Use the continuity tester to determine whether each material in your lab station is a conductor of electricity. Touch the free wire ends to each material. Did the bulb light? If it did, the material is an electrical conductor. If it did not, the material is an electrical insulator. Record your observations in your data table under the column labeled "Electrical Conductivity." Disconnect all materials from the continuity tester before moving to the next lab station.

Lab Station 3

Turn on the lamp. One by one, place each material in your lab station under the lamp. After a few seconds, touch each material to determine whether it feels warm. If it does, it is a heat conductor. If it does not, it is a heat insulator. Record your observations in your data table under the column labeled "Heat Conductivity." Turn off the lamp before moving to the next lab station.

Lab Station 4

Hold the magnet near each one of the materials in your lab station. Is the magnet attracted to the material? If it is, the material is magnetic. Record your observations in the data table under the column labeled "Magnetism."

Lab Station 5

Ensure that both pans of the balance are equally balanced (i.e., zero the balance). Place each material, one at a time, on one side of the balance. If the pan holding the tested material drops lower than the empty pan, then the tested material has mass. (To test the rock salt and the water, pour each into a paper cup, and set the paper cup on one pan of the balance. Place an empty paper cup on the other pan to offset the mass of the filled cup.) Record your observations in the data table under the column labeled "Mass." Remove all materials from the balance before moving to the next lab station.

Lab Station 6

Place each material in the pan of water, one at a time. Gently push each material below the surface of the water. (This will overcome any effects of surface tension on the material.) Determine whether the material floats. Record your observations in the data table under the column labeled "Relative Density." Remove and dry all materials before moving to the next lab station.

Lab Station 7

Place each material in the pan of water, one at a time. With the spoon or stick, gently stir the water to determine whether the material dissolves. Record your observations in the data table under the column labeled "Solubility in Water." Remove and dry all materials and change the water in the pan before moving to the next lab station.

Data Table

Material	State of Matter			Does It Have Shape?		Electrical Conductivity		Heat Conductivity		Magnetism		Mass		Relative Density		Solubility in Water	
	Solid	Liquid	Gas	Yes	No	Conductor	Insulator	Conductor	Insulator	Yes	No	Yes	No	Floats in Water	Sinks in Water	Soluble	Not Soluble
aluminum nail																	
steel paper clip																	
wooden ruler																	
plastic fork																	
Styrofoam																	
rubber band																	
air																	
water																	
rock salt																	

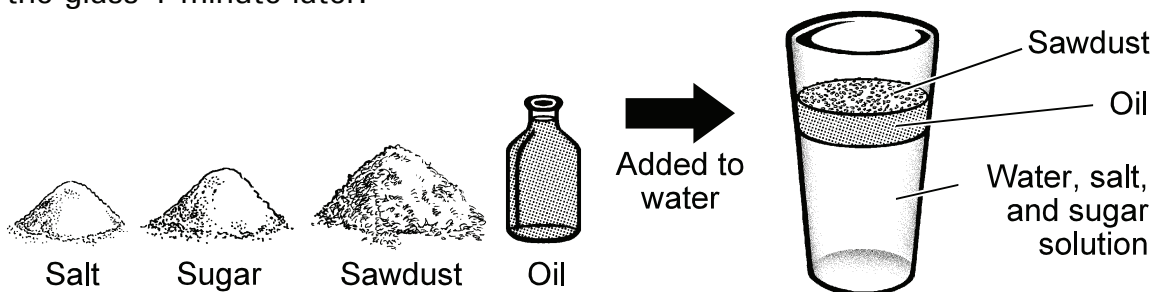
Conclusion

- 1 What do all electrical conductors have in common?
- 2 What types of matter are the best heat conductors?
- 3 What is unique about the tested magnetic materials?

Classify matter based on measurable, testable, and observable physical properties including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating using water as a reference point), solubility in water, and the ability to conduct or insulate thermal energy or electric energy.

- 1 You are asked to classify a silver-colored object based on its physical properties. The object is solid, has mass, and sinks when placed in a bucket of water. The object conducts electricity, and it warms quickly to the touch when placed beneath a lamp. However, when you touch the object with a magnet, the object is not attracted to the magnet. Based on these physical properties, the object is most likely made out of —
- A aluminum.
 - B wood.
 - C iron.
 - D cement.

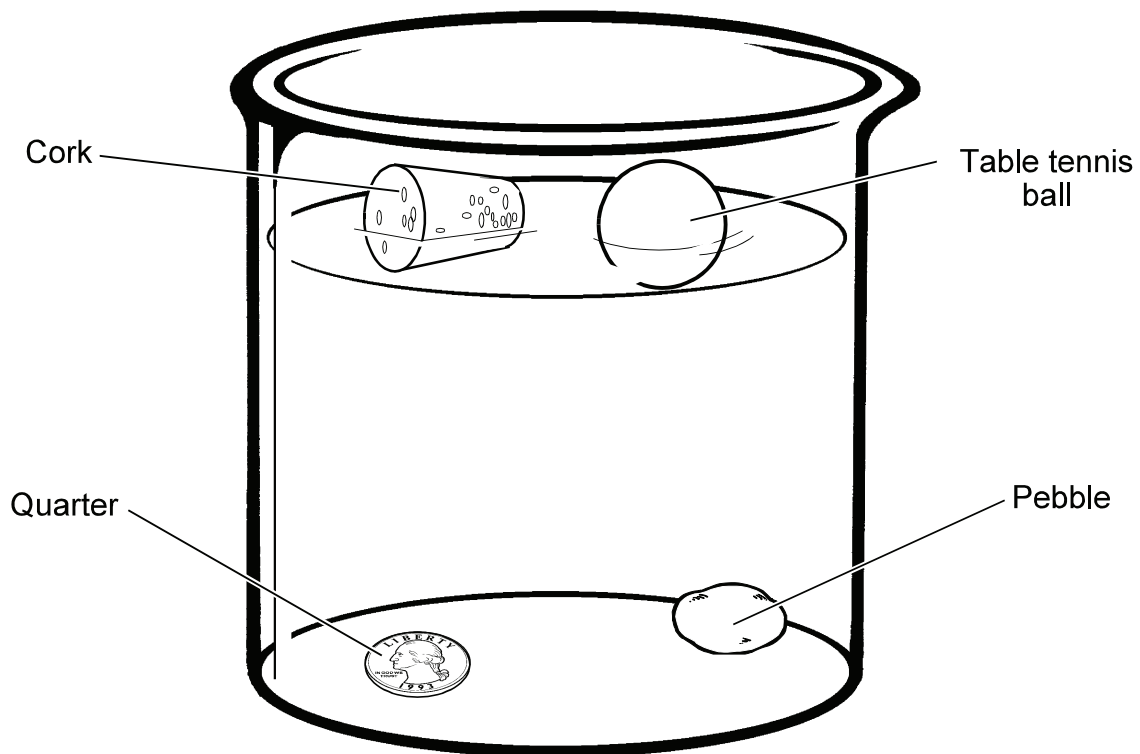
- 2 Manuella is testing four substances. She places the substances in a glass of water, stirs the water with the substances for 2 minutes, and then looks at the glass 1 minute later.



Based on Manuella's observations, which of the following statements is correct?

- F The salt and sugar are soluble in water, but the oil and sawdust are not soluble in water.
- G The salt, sugar, and oil are liquids, but the sawdust is a solid.
- H The salt and sugar are less dense than the oil and sawdust.
- J The salt and sugar do not have mass, but the oil and sawdust do have mass.

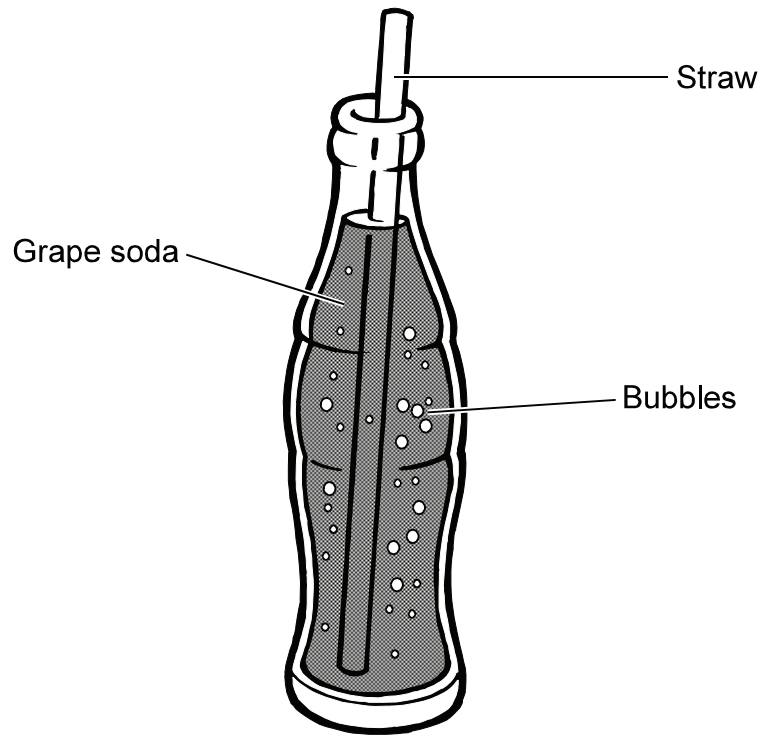
- 3 Hugo places four objects into a beaker filled with water.



Which of the following statements correctly describes the relative density of the objects in the beaker?

- A The quarter and pebble are less dense than the water, but denser than the cork and the table tennis ball.
- B The quarter and pebble are denser than the water, the cork, and the table tennis ball.
- C The quarter and pebble are denser than the water, but less dense than the cork and the table tennis ball.
- D The quarter and pebble are less dense than the water, the cork, and the table tennis ball.

- 4 Jason opens a bottle of grape soda and inserts a straw into the bottle to drink the soda.



How should each matter be classified?

- F The grape soda is a liquid, the bubbles are solids, and the straw is a solid.
- G The grape soda is a liquid, the bubbles are liquids, and the straw is a solid.
- H The grape soda is a liquid, the bubbles are gases, and the straw is a solid.
- J The grape soda is a gas, the bubbles are gases, and the straw is a solid.

- 5 Students in a science class try to divide the class into two groups: students whose mass is greater than 30 kilograms and students whose mass is less than 30 kilograms. One student, Ron, has a mass of exactly 30 kilograms. What method should the students use to divide the class?
- A Students should line up by height. Students taller than Ron should form one group and students shorter than Ron should form another group.
 - B Students should line up by age. Students older than Ron should form one group and students younger than Ron should form another group.
 - C Ron should get on one end of a see-saw and each of the other students, one at a time, should get on the other end. Students who make Ron's end go up should form one group and students who make Ron's end go down should form another group.
 - D Students should measure their waist sizes. Students with waist sizes larger than Ron's should form one group and students with waist sizes smaller than Ron's should form another group.
- 6 Winnie conducts an investigation to test the ability of four different materials to insulate thermal energy. She covers four identical boxes each with a different type of material. She takes four glasses of water out of the refrigerator, measures the temperature of the water in each glass, and places each glass of water in a box. After thirty minutes, she measures the temperature of the glass of water in each box and records her measurements in a table.

Type of Material Covering Box	Temperature at Beginning of Investigation	Temperature after 30 Minutes
wool	5°C	9°C
Styrofoam	6°C	8°C
aluminum	5°C	18°C
leather	6°C	12°C

Which list ranks the materials in order from least to greatest ability to insulate thermal energy?

- F Styrofoam, wool, leather, aluminum
- G wool, aluminum, Styrofoam, leather
- H wool, Styrofoam, leather, aluminum
- J aluminum, leather, wool, Styrofoam