

Material Detectives

Compare materials by using evidence from tests.

5.6.A "compare and contrast matter based on measurable, testable, or observable physical properties, including mass, magnetism, relative density (sinking and floating using water as a reference point), physical state (solid, liquid, gas), volume..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Circle each bold physical property. For each one, underline the nearby words that tell the test result, then number the eight properties as you find them.

Tests at the Materials Lab

- ① At a materials lab, students compared an aluminum cube, a steel washer, a pine block, and a plastic bead. They measured **mass** with a balance and **volume** by fully submerging each solid in water and measuring the water it pushed aside. The cube and washer had equal volumes, but the washer had greater mass. The pine block had the largest volume.
- ② The group tested **magnetism** with a magnet. Only the steel washer was pulled to the magnet. In water, the pine block and plastic bead floated, while the aluminum cube and steel washer sank. This **relative density** test used water as the reference. The floating objects were less dense than water, and the sinking objects were more dense. No object showed **solubility in water** because none dissolved.
- ③ The group tested energy transfer next. In a simple circuit, they tested **electrical conduction**. The aluminum cube and steel washer conducted electric energy. The pine block and plastic bead insulated electric energy. When one end was warmed, the metals showed **thermal conduction** more quickly than the wood and plastic, which insulated thermal energy. All four materials stayed in the **solid physical state** during every test.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Which two objects had equal volume? Which one had greater mass?

2 Compare the relative density of the pine block and the aluminum cube using water as the reference.

3 How did the steel washer and the plastic bead differ in magnetism and in water?

4 Name one physical property the aluminum cube and steel washer shared. Name one physical property that was different.

3 YOUR TURN _____ Your own words

Choose two materials named in the passage. Write their names in the table, then compare them using three properties from the passage. Include one water result and one energy-transfer result.

PROPERTY	MATERIAL 1	MATERIAL 2

PART 1 • READ AND MARK

Circle each bold physical property. For each one, underline the nearby words that tell the test result, then number the eight properties as you find them. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Which two objects had equal volume? Which one had greater mass?	The aluminum cube and steel washer had equal volume. The steel washer had greater mass.
2	Compare the relative density of the pine block and the aluminum cube using water as the reference.	The pine block floated, so it was less dense than water. The aluminum cube sank, so it was more dense than water.
3	How did the steel washer and the plastic bead differ in magnetism and in water?	The steel washer was pulled to the magnet and sank in water. The plastic bead was not pulled to the magnet and floated in water.
4	Name one physical property the aluminum cube and steel washer shared. Name one physical property that was different.	They both conducted electric energy, sank in water, and were solids. The steel washer had greater mass, and only the washer was magnetic.

PART 3 • YOUR TURN (SAMPLE ANSWER)

PROPERTY	MATERIAL 1	MATERIAL 2
Material name	aluminum cube	pine block
Water behavior and relative density	sank, more dense than water	floated, less dense than water
Electrical conduction	conducted electric energy	insulated electric energy
Physical state	solid	solid

Accept equivalent evidence-based wording from the passage. For the open table, accept any two of the four named materials if all three comparisons match stated test results and include water behavior plus energy transfer.