Hawk Mastery

1. **(Bias and Error)** A student wanted to find out if marbles with lager diameters made deeper craters when dropped into wet sand than marbles with smaller diameters. The table below shows the student's data.
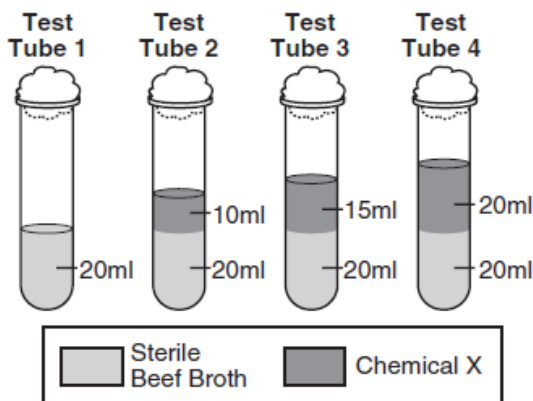
Marble Dropping Investigation

Marble	Marble Diameter (millimeters)	Marble Mass (grams)	Height to Drop Marble (meters)	Crater Depth (millimeters)
1	13	21	2	4
2	14	18	2	3
3	15	23	2	6
4	16	20	2	5

The student concluded marble diameter had no effect on crater depth. Which is the most likely reason this conclusion is flawed?

    A.   The student should have used more than four marbles.
    B.   The student should have used marbles that had the same mass.
    C.   The student should have dropped marbles from different heights.
    D.   The student should have dropped the marbles in flour instead of sand.

2. **(Variables and Controls)**

Test Tube 1 — 20ml
Test Tube 2 — 10ml, 20ml
Test Tube 3 — 15ml, 20ml
Test Tube 4 — 20ml, 20ml

Legend: Sterile Beef Broth / Chemical X

A biochemist is performing an experiment to determine the effects of Chemical X on the growth of bacteria. Which is the control?

A Test tube 1

B Test tube 2

C Test tube 3

D Test tube 4

3. **(Cause and Effect)** You are outdoors on a cold winter day. The sun is shining brightly. A strong wind blows out of the north. You wrap a scarf tightly around your neck. You shiver. Which pair of words represents a cause-and-effect relationship?

    A.   Scarf; shiver   C.   Shiver; wind
    B.   Wind; shiver   D.   Sun; shiver

4. **(Tools and Procedures)** Students are conducting an investigation in which they find the density of an unknown solid by measuring its mass and volume. Which describes the tools they will need to conduct their investigation?

A. a beaker and a thermometer
B. a spring scale and a graduated cylinder
C. a triple beam balance and a speedometer
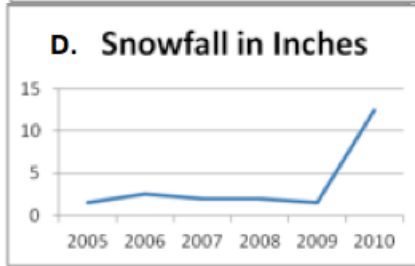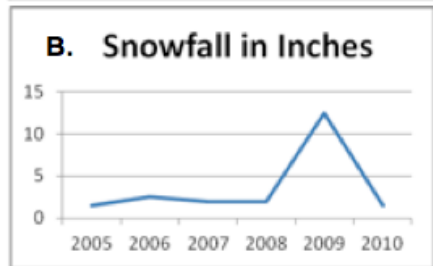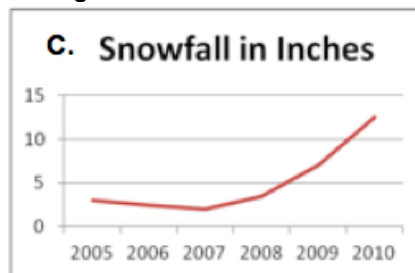D. a triple beam balance and a graduated cylinder

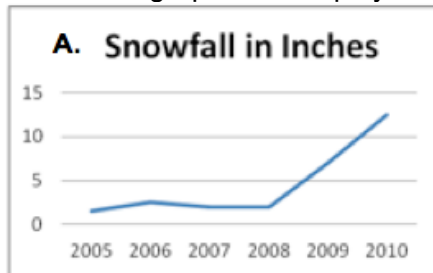5. **(Interpreting Data)** The table below shows the snowfall in Nashville, TN over a six year period.

School Year	Snowfall
2005	3
2006	2.5
2007	2
2008	3.5
2009	7
2010	12.5

Which line graph best displays the changes in snowfall over the six-year period?

A. Snowfall in Inches

C. Snowfall in Inches

B. Snowfall in Inches

D. Snowfall in Inches

6. **(Prototype Testing)** An engineer invents a robot that can assemble cars. Many car manufacturers buy the robot to use in their factories. What is the most likely effect of this new technology?

   A. Cars will be assembled more quickly and accurately.

   B. People will start using cars less and bicycles more.

   C. The factories will completely stop employing humans.

   D. The price of new cars will increase drastically.

7. **(Prototype Testing)** Certain exposures to radiation can cause cancer. What is the main difference between the use of radiation treatments to treat cancer and exposures that cause cancer?

   A. Longer term exposure to radiation increases cancer risk.

   B. Calculated exposure to radiation decreases cancer risk.

   C. Larger doses of radiation increase cancer risk.

   D. all of these