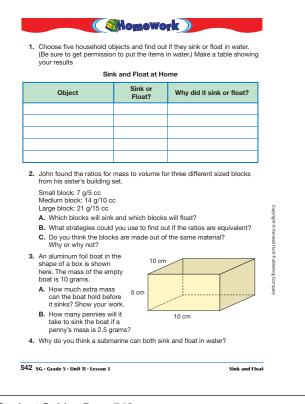**Homework (SG p. 542)**
Questions 1–4

1. Answers will vary. Items sink because their mass is greater than their volume. Items float if their mass is less than their volume.

2. **A.** All of the blocks will sink because the mass is greater than the volume.

   B. Use multiplication and division to see that they are equivalent fractions.

   C. The blocks are probably made out of the same material because the $\frac{M}{V}$ ratios are equivalent, and they are part of the same block set. However, the blocks could be made out of different materials that have the same $\frac{M}{V}$ ratio.

3. **A.** The volume of the box is
   10 cm $\times$ 5 cm $\times$ 10 cm = 500 cc. The total mass of the boat (mass of the empty boat and the mass of the load) cannot be more than 500 or the boat will sink. If the ratio $\frac{M}{V}$ is greater than 1, the boat will sink. As long as the extra mass is less than 490 g, the total mass will be less than 500 g and the boat will still float.

   B. The boat will sink if the total mass (mass of the empty boat and the mass of the load) is greater than 500. Since the mass of the empty boat is 10 g and the volume of the boat is 500 cc, the total mass of the pennies needs to be greater than 490 g.
   196 pennies $\times$ 2.5 g = 490 g. Therefore, a load of 197 pennies or more will sink the boat.

4. Answers will vary.

   A submarine has chambers that sailors control and can open and close to fill with water or empty to fill with air. When the chambers are filled with water, the mass increases to be greater than the volume, and the submarine sinks; when the chambers are filled with air, the mass decreases to be less than the volume of the submarine, and the submarine floats.
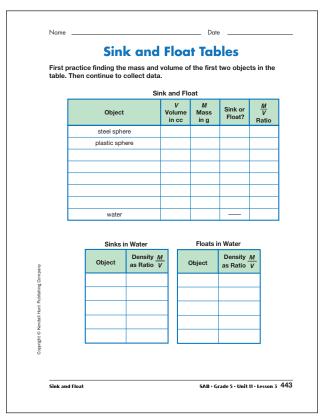
Student Activity Book

Sink and Float Tables (SAB p. 443)

* See Figures 2 and 4 in the lesson for sample completed tables.

*Answers and/or discussion are included in the lesson.

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