

## Aerogels in Action Worksheet **Answers**

1. List the *hydrophobic* materials used in the activity.

vegetable oil  
aerogel

2. List the *hydrophilic* materials used in the activity.

water  
food coloring

3. A typical 1-cm<sup>3</sup> silica aerogel weighs 0.1 grams; calculate its density.

The density of the silica aerogel is its mass divided by its volume, so 0.1g/cm<sup>3</sup>.

4. How many nanometers are in 1 meter?

1 meter = 1-billion nanometers (10<sup>9</sup> or 1,000,000,000)  
Nano represents 1-billionth of a measurement.

5. Explain why the food coloring was pushed from the oil to the water.

The food coloring fell out of the oil because the hydrophobic aerogel was absorbing the hydrophobic oil (like goes to like), and repelling the hydrophilic food coloring. The water and the food coloring, both hydrophilic, were attracted to each other.

6. What are some other ways we could use hydrophobic aerogels? List at least two. *Be creative and have fun coming up with novel ideas!*

Possible answers: to make phones, decks, car windshields and other items waterproof, as hairspray, as socks for people hiking in rainforests, to put on diving suits, to coat the insides of boats, etc.