Black in the Spotlight

Name: _____

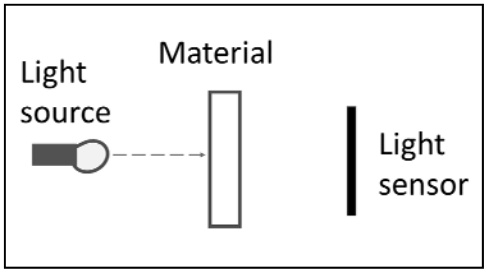
Date: _____

Student quiz—Answer key

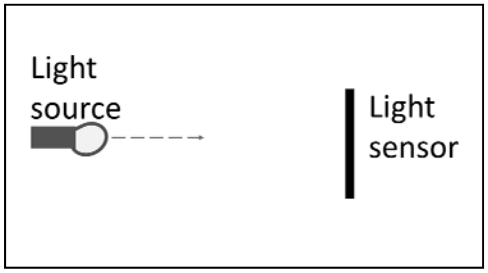
Directions: Circle the best answer for the multiple-choice question below.

1. Analyze the setup and light intensity data. What can you conclude about the material under study?

Setup A:



Setup B:



	Light intensity measurements (lux)
Setup A, light source is off	4
Setup A, light source is on	300
Setup B, light source is on	350
Setup B, light source is off	4

a. This material reflects most of the light.
b. This material absorbs most of the light.
c. This material transmits most of the light.
d. There is not enough information to draw a conclusion.

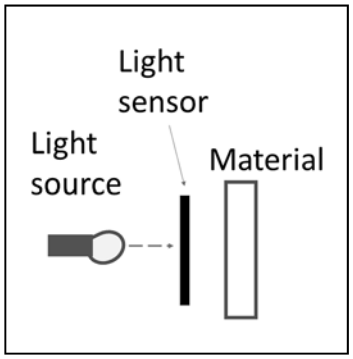
Black in the Spotlight— Page 2

Name: _____

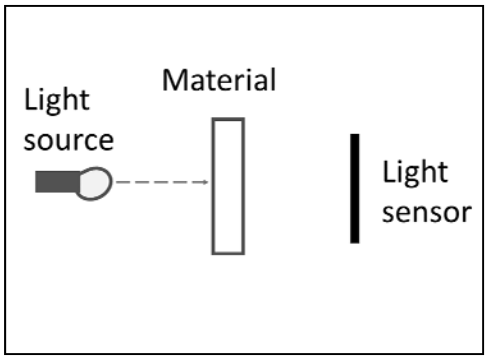
Directions: Circle the best answer for the multiple-choice question below.

2. Analyze the setup and light intensity data. What can you conclude about the material under study?

Setup A:



Setup B:



	Light intensity measurements (lux)
Setup sketch A, light source is off	4
Setup sketch A, light source is on	540
Setup sketch B, light source is on	120
Setup sketch B, light source is off	5

a. This material reflects most of the incident light.
b. This material absorbs most of the incident light.
c. This material transmits most of the incident light.
d. None of the above.

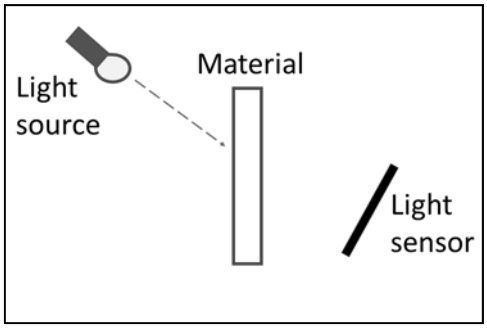
Black in the Spotlight— Page 3

Name: _____

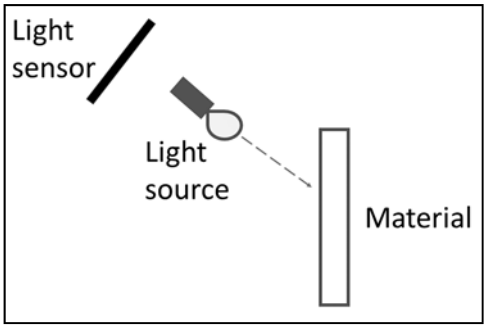
Directions: Circle the best answer for the multiple-choice question below.

3. Which setup(s) is most effective when you need to prove that a shiny material reflects light? Note that for each setup, you take measurements with and without the material in place.

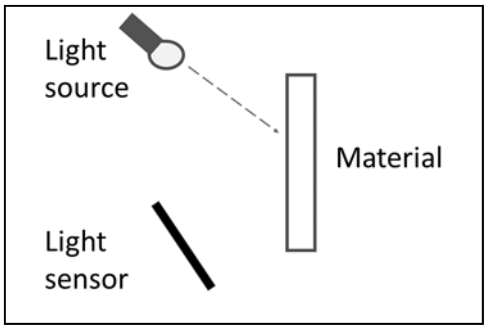
Setup A:



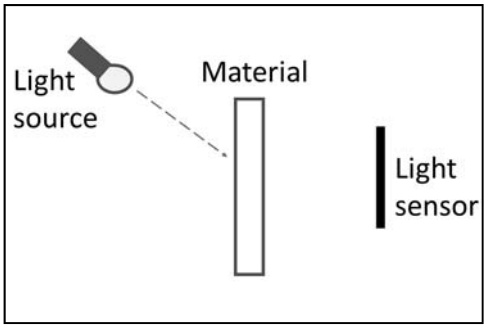
Setup B:



Setup C:



Setup D:



a. Setup A only
b. Setup A and B
c. Setup C only
d. Setup C and D

Black in the Spotlight—Page 4

Name: _____

Directions: Write your answer for the questions below.

4. Explain what absorption of light is and how we can detect it.

Answers for the explanation of absorption may include, but are not limited to, the following:

- Absorption of light means the material sucks up (captures or traps) the light.
- Absorbed light energy is transferred into thermal energy of the material.

Answers for how it can be detected may include, but are not limited to the following:

- We can detect absorbed light by an absence of light being reflected or transmitted by the material.
- We can detect absorbed light by measuring how the material absorbing the light heats up.

5. Explain why it is hard to see details in materials that are painted in an extremely dark black.

Answers should include that black materials absorb most of the light. Since they reflect very little light, we cannot see any details of the object.