

Lesson 8: Answer Key

Lesson 8 Assessment Answer Key

1. Write your collision scenario here. If you choose your own collision, you can have neither, one, or both of the objects break. Be sure to describe which object (if any) breaks. You may find it helpful to sketch a picture.

Answers will vary. Students should select a scenario with just two objects colliding with any of three possible outcomes: both objects break, one object breaks, or neither object breaks.

2. Write a question you will answer. The question should be phrased like one of these examples:

How could both the TV and the phone break during the collision?

How could the phone break but the TV not break during the collision?

How could neither the phone nor the TV break during the collision?

Answers will vary. The question students write should match the outcome of the scenario described in question 1. That is, if they describe a scenario in which both objects break, their question should ask how both objects could break.

3. Sketch a picture of the forces on the objects in the collision. Use two different colors and arrows to show the forces.

+1 Students show draw arrows on the objects that feel each force.

+1 There should be two arrows of equal length.

+1 The students should color-coordinate the force arrows with the objects that produced the force.

4. Describe the forces on the objects in the collision.

+1 The explanation indicates that there are two forces on the objects. Each object experiences a force in the collision. If students go beyond this point and describe other reasonable forces acting on the objects that are not part of the collision, that's fine.

5. If you listed more than one force in questions 2 and 3 above, explain which force is the biggest and provide evidence from your investigations to support your answer.

+1 Students indicate that the two forces were equal in strength and opposite in direction.

+1 Students provide evidence from at least one investigation demonstrating that the two push-pull spring scales showed the same size force under a variety of conditions (different masses, different starting speeds, and different materials).

6. Explain why each object in your collision did or didn't break.

+1 The explanation indicates that if an object broke, it is because the force on the object was bigger than the elastic limit of the object.

+1 The explanation indicates that objects may not break because of the thickness of the object.

+1 The explanation indicates that objects may not break because of the type of material of the object.

7. Is there more than one reason why the objects in your collision broke (or didn't break)? If so, what are they?

+1 Students indicate that there many causes for breaking, including

+1 the size of the force,

+1 the thickness of the material, and

+1 the type of material.