

Grade 8 Science

Unit 1: Contact Forces

Driving question: Why do things sometimes get damaged when they hit each other?

22 lessons (investigations and weekly readings) and a words quiz. Use this pack with the unit's **Teacher Guide**, **Student Procedure Guide**, **Student Work Pages** and **Science Literacy Student Reader** (download them once from the course) to teach the whole unit without the internet.

What is in this pack

- A plan for each lesson: the lesson question, how many class days it takes, the Teacher Guide pages to follow, and the student pages to print.
- For each weekly reading: the Student Reader pages, words to know and the exercise page.
- The words quiz, ready to print, with its key at the back.

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Lesson schedule

Each investigation lesson takes the number of class days shown (about 45 minutes a day). Do each reading over a week alongside the lessons. Tick each one off as you go.

	Lesson	Days	Student pages
☐	Reading: Science Literacy Preface: Put Yourself in This Scene	1 week	—
☐	Lesson 1: What happens when two things hit each other?	3	3 to print
☐	Lesson 2: What causes changes in the motion and shape of colliding objects?	2	2 to print
☐	Reading: Science Literacy Collection 1: Collisions	1 week	1 to print
☐	Lesson 3: Do all objects change shape or bend when they are pushed in a collision?	1	2 to print
☐	Lesson 4: How much do you have to push on any object to get it to deform (temporarily vs. permanently)?	2	5 to print
☐	Lesson 5: How does changing the mass or speed of a moving object before it collides with another object affect the forces on those objects during the collision?	2	4 to print
☐	Reading: Science Literacy Collection 2: Bounce Back, Bend, Break, or Push	1 week	1 to print
☐	Lesson 6: What have we figured out about objects interacting in collisions? How can we apply our new learning to answer questions about objects interacting in collisions?	1	2 to print
☐	Lesson 7: How much does doubling the speed or doubling the mass affect the kinetic energy of an object and the resulting damage that it can do in a collision?	2	7 to print
☐	Lesson 8: Where did the energy in our launcher system come from, and after the collisions where did it go to?	1	6 to print

	Lesson	Days	Student pages
☐	Lesson 9: How do other contact forces from interactions with the air and the track cause energy transfers in the launcher system?	2	6 to print
☐	Lesson 10: Why do some objects break or not break in a collision?	2	3 to print
☐	Lesson 11: What can we design to better protect objects in a collision?	2	3 to print
☐	Reading: Science Literacy Collection 4: Materials, Design, and Outcomes	1 week	1 to print
☐	Lesson 12: What materials best reduce the peak forces in a collision?	2	6 to print
☐	Lesson 13: How (and why) does the structure of a cushioning material affect the peak forces produced in a collision?	3	6 to print
☐	Reading: Science Literacy Collection 5: Structures and Forces	1 week	1 to print
☐	Lesson 14: How can we use our science ideas and other societal wants and needs to refine our designs?	2	5 to print
☐	Lesson 15: How can we use what we figured out to evaluate another engineer's design?	2	3 to print
☐	Lesson 16: OPTIONAL How can we market our designs to our potential investors?	4	6 to print
☐	Reading: Science Literacy Collection 6	—	1 to print
☐	Words quiz	—	—

Page numbers are PDF page numbers of each file, so they match what your PDF reader shows.

Reading: Science Literacy Preface: Put Yourself in This Scene

Words to know

- **energy** — the capacity to do work
- **gravity** — the force that tends to cause physical objects to move toward each other based on mass
- **mass** — a measure of the amount of matter in an object; a measure of the amount of inertia in an object
- **speed** — rate of motion

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 28–31: the steps, materials and timing for this lesson.

Read

Read Science Literacy Student Reader, Preface: “Put Yourself in This Scene”: PDF pages 6–7. Look at the pictures and maps together.

Check for understanding

- Use one of today's words in a sentence of your own.

Lesson 1: What happens when two things hit each other?

LESSON QUESTION

What happens when two things hit each other?

Plan about **3 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 32–60: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 6–10
- Initial Model: Objects During Collisions — Student Work Pages, PDF pages 7–8
- Object Interactions During a Collision — Student Work Pages, PDF pages 9–10

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation:
What happens when two things hit each other?

Lesson 2: What causes changes in the motion and shape of colliding objects?

LESSON QUESTION

What causes changes in the motion and shape of colliding objects?

Plan about **2 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 61–82: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 11–14
- Exploring Horizontal Collisions — Student Work Pages, PDF pages 11–12

For the teacher

- Teacher Reference — Teacher Guide, PDF pages 368–369

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation:
What causes changes in the motion and shape of colliding objects?

Reading: Science Literacy Collection 1: Collisions

Words to know

- **acceleration** — a change in velocity
- **collision** — a physical meeting of objects as a result of motion
- **concussion** — a brain injury that occurs when the head is struck by, or strikes, another object or surface, causing the brain to strike the inside of the skull
- **context** — all the words and ideas that surround an individual word, passage, event, or situation and can shed light on its meaning
- **design** — to plan and/or make something for a specific purpose or use
- **energy** — the capacity to do work
- **force** — a push or pull on a mass that causes the mass's velocity to change
- **frame of reference** — the point of view from which we are describing or measuring motion within the context of a system of objects
- **friction** — the resistance of motion between objects or materials that are in contact
- **gravity** — the force that tends to cause physical objects to move toward each other based on mass
- **kinetic energy** — the form of energy that an object has by reason of its motion
- **mass** — a measure of the amount of matter in an object; a measure of the amount of inertia in an object

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 83–89: the steps, materials and timing for this lesson.

Read

Read Science Literacy Student Reader, Collection 1: “Collisions”: PDF pages 8–17. Look at the pictures and maps together.

Student pages to print

- Exercise Page 1 — Student Work Pages, PDF pages 113–114

Check for understanding

- Use one of today's words in a sentence of your own.

Lesson 3: Do all objects change shape or bend when they are pushed in a collision?

LESSON QUESTION

Do all objects change shape or bend when they are pushed in a collision?

Plan about **1 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 90–103: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 15–18
- Claim and Observations Organizer — Student Work Pages, PDF pages 13–14

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation:
Do all objects change shape or bend when they are pushed in a collision?

Lesson 4: How much do you have to push on any object to get it to deform (temporarily vs. permanently)?

LESSON QUESTION

How much do you have to push on any object to get it to deform (temporarily vs. permanently)?

Plan about **2 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 104-121: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 19-21
- Deformation Results — Student Work Pages, PDF pages 15-16
- Independent, Dependent, and Controlled Variables — Student Work Pages, PDF pages 17-18
- Results from Other Materials Tests — Student Work Pages, PDF pages 19-22
- Reference: Investigation Procedures — Student Procedure Guide, PDF page 56

For the teacher

- Teacher Reference — Teacher Guide, PDF page 370

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation: How much do you have to push on any object to get it to deform (temporarily vs. permanently)?

Lesson 5: How does changing the mass or speed of a moving object before it collides with another object affect the forces on those objects during the collision?

LESSON QUESTION

How does changing the mass or speed of a moving object before it collides with another object affect the forces on those objects during the collision?

Plan about **2 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 122–144: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 22–25
- Comparing Forces on Two Push-Pull Spring Scales — Student Work Pages, PDF pages 23–24
- Independent, Dependent, and Controlled Variables — Student Work Pages, PDF pages 25–26
- Reading: How does touch work? — Student Procedure Guide, PDF pages 77–80

For the teacher

- Teacher Reference — Teacher Guide, PDF pages 371–375

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation:
How does changing the mass or speed of a moving object before it collides with another object affect the forces on those objects during the collision?

Reading: Science Literacy Collection 2: Bounce Back, Bend, Break, or Push

Words to know

- **breaking point** — the degree of stress under a force at which something breaks
- **brittle** — easily broken or shattered
- **collision** — a physical meeting of objects as a result of motion
- **deform** — to change shape
- **deformation** — a change in shape or form
- **elastic** — capable of recovering size and shape after being deformed
- **elastic limit** — the maximum stress a material can withstand without permanent deformation
- **elastomer** — any substance with properties similar to rubber
- **energy** — the capacity to do work
- **flexible** — capable of being flexed
- **fluid** — matter that does not hold a fixed shape and is able to flow; gases and liquids
- **force** — a push or pull on a mass that causes the mass's velocity to change

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 145–151: the steps, materials and timing for this lesson.

Read

Read Science Literacy Student Reader, Collection 2: “Bounce Back, Bend, Break, or Push”: PDF pages 18–27. Look at the pictures and maps together.

Student pages to print

- Exercise Page 2 — Student Work Pages, PDF pages 115–116

Check for understanding

- Use one of today's words in a sentence of your own.

Lesson 6: What have we figured out about objects interacting in collisions? How can we apply our new learning to answer questions about objects interacting in collisions?

LESSON QUESTION

What have we figured out about objects interacting in collisions? How can we apply our new learning to answer questions about objects interacting in collisions?

Plan about **1 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 152–160: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 26–27
- Reviewing Our Driving Question Board — Student Work Pages, PDF pages 27–28

For the teacher

- Answer Key — Teacher Guide, PDF pages 376–379

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation: What have we figured out about objects interacting in collisions? How can we apply our new learning to answer questions about objects interacting in collisions?

Lesson 7: How much does doubling the speed or doubling the mass affect the kinetic energy of an object and the resulting damage that it can do in a collision?

LESSON QUESTION

How much does doubling the speed or doubling the mass affect the kinetic energy of an object and the resulting damage that it can do in a collision?

Plan about **2 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 161–184: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 28–31
- Changes in Kinetic Energy: Investigations 1 & 2 — Student Work Pages, PDF pages 29–30
- Graphing Kinetic Energy Relationships — Student Work Pages, PDF pages 31–32
- Alternate: Graphing Mass vs. Kinetic Energy — Student Work Pages, PDF page 33
- Alternate: Graphing Speed vs. Kinetic Energy — Student Work Pages, PDF page 34
- Looking Back: Explaining and Predicting Kinetic Energy Changes — Student Work Pages, PDF pages 35–36
- Reference: Procedure for Investigation 1 — Student Procedure Guide, PDF pages 57–58

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation: How much does doubling the speed or doubling the mass affect the kinetic energy of an object and the resulting damage that it can do in a collision?

Lesson 8: Where did the energy in our launcher system come from, and after the collisions where did it go to?

LESSON QUESTION

Where did the energy in our launcher system come from, and after the collisions where did it go to?

Plan about **1 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 185-197: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF page 32
- Energy Transfers and Contact Forces in the System — Student Work Pages, PDF pages 37-38
- Investigating Interactions with the Air — Student Work Pages, PDF pages 39-40
- Investigating Surface Interactions — Student Work Pages, PDF pages 41-44
- Modeling Other Force Interactions — Student Work Pages, PDF pages 45-46
- Tracking Energy Transfers in Our Launcher System — Student Work Pages, PDF pages 47-48

For the teacher

- Answer Key — Teacher Guide, PDF page 380

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation: Where did the energy in our launcher system come from, and after the collisions where did it go to?

Lesson 9: How do other contact forces from interactions with the air and the track cause energy transfers in the launcher system?

LESSON QUESTION

How do other contact forces from interactions with the air and the track cause energy transfers in the launcher system?

Plan about **2 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 198-217: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 33-35
- Data Collection from Stations — Student Work Pages, PDF pages 49-50
- Jigsaw Feedback Discussion — Student Work Pages, PDF pages 51-52
- Reference: Lab Station Instructions — Student Procedure Guide, PDF pages 59-60
- Reference: Station 2 Data Cards — Student Procedure Guide, PDF pages 61-62
- Reference: Microscopic Image Cards — Student Procedure Guide, PDF pages 63-67

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation:
How do other contact forces from interactions with the air and the track cause energy transfers in the launcher system?

Lesson 10: Why do some objects break or not break in a collision?

LESSON QUESTION

Why do some objects break or not break in a collision?

Plan about **2 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 218–231: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 36–37
- Big Ideas Table — Student Work Pages, PDF pages 53–54
- Explaining a Collision — Student Work Pages, PDF pages 55–56

For the teacher

- Teacher Reference — Teacher Guide, PDF pages 381–386
- Answer Key 1 — Teacher Guide, PDF pages 387–403

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation:
Why do some objects break or not break in a collision?

Lesson 11: What can we design to better protect objects in a collision?

LESSON QUESTION

What can we design to better protect objects in a collision?

Plan about **2 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 232–247: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 38–41
- Drafting Our Protection Device Design — Student Work Pages, PDF pages 57–58
- Protection Device Design Thinking — Student Work Pages, PDF pages 59–60

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation:
What can we design to better protect objects in a collision?

Reading: Science Literacy Collection 4: Materials, Design, and Outcomes

Words to know

- **acceleration** — a change in velocity
- **collision** — a physical meeting of objects as a result of motion
- **constraint** — a limitation or restriction on a process or product
- **criteria** — needs that are to be met by a product or process
- **design** — to plan and/or make something for a specific purpose or use
- **elastic** — capable of recovering size and shape after being deformed
- **force** — a push or pull on a mass that causes the mass's velocity to change
- **mandate** — a command or official order to do something
- **mass** — a measure of the amount of matter in an object; a measure of the amount of inertia in an object
- **model** — a representation of a real thing
- **power** — the transfer of energy over time
- **speed** — rate of motion

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 248–254: the steps, materials and timing for this lesson.

Read

Read Science Literacy Student Reader, Collection 4: “Materials, Design, and Outcomes”: PDF pages 38–47. Look at the pictures and maps together.

Student pages to print

- Exercise Page 4 — Student Work Pages, PDF pages 119–120

Check for understanding

- Use one of today's words in a sentence of your own.

Lesson 12: What materials best reduce the peak forces in a collision?

LESSON QUESTION

What materials best reduce the peak forces in a collision?

Plan about **2 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 255–273: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 42–45
- Cushioning Materials Testing Procedures — Student Work Pages, PDF pages 61–64
- How can materials reduce peak force on the objects they protect? — Student Work Pages, PDF pages 65–66
- Reference: Cushioning Materials Testing Procedures — Student Procedure Guide, PDF pages 68–71
- Reference: Up Close Images — Student Procedure Guide, PDF pages 72–75
- Reading: How do we sense different textures? — Student Procedure Guide, PDF pages 81–82

For the teacher

- Teacher Reference 1 — Teacher Guide, PDF page 404
- Teacher Reference 2 — Teacher Guide, PDF page 405

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation: What materials best reduce the peak forces in a collision?

Lesson 13: How (and why) does the structure of a cushioning material affect the peak forces produced in a collision?

LESSON QUESTION

How (and why) does the structure of a cushioning material affect the peak forces produced in a collision?

Plan about **3 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 274–302: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 46–48
- Exploring Shape of a Cushioning Material — Student Work Pages, PDF pages 67–68
- Free Body Diagrams for Collisions — Student Work Pages, PDF pages 69–70
- Observations from Adding Additional Ring Structures — Student Work Pages, PDF pages 71–72
- Reading: Anatomy of a Bike Helmet — Student Work Pages, PDF pages 73–76
- Reading: Anatomy of a Bike Helmet — Student Procedure Guide, PDF pages 83–88

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation: How (and why) does the structure of a cushioning material affect the peak forces produced in a collision?

Reading: Science Literacy Collection 5: Structures and Forces

Words to know

- **acceleration** — a change in velocity
- **air resistance** — the friction that air exerts on an object moving through it; drag
- **collision** — a physical meeting of objects as a result of motion
- **constraint** — a limitation or restriction on a process or product
- **contact force** — any force that requires physical contact between objects
- **context** — all the words and ideas that surround an individual word, passage, event, or situation and can shed light on its meaning
- **design** — to plan and/or make something for a specific purpose or use
- **distribution of force** — the amount of force that is spread out over a certain area
- **efficacy** — a measure of how well a technology or behavior produces a desired result
- **elastic** — capable of recovering size and shape after being deformed
- **energy** — the capacity to do work
- **flexible** — capable of being flexed

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 303–309: the steps, materials and timing for this lesson.

Read

Read Science Literacy Student Reader, Collection 5: “Structures and Forces”: PDF pages 48–67. Look at the pictures and maps together.

Student pages to print

- Exercise Page 5 — Student Work Pages, PDF pages 121–122

Check for understanding

- Use one of today's words in a sentence of your own.

Lesson 14: How can we use our science ideas and other societal wants and needs to refine our designs?

LESSON QUESTION

How can we use our science ideas and other societal wants and needs to refine our designs?

Plan about **2 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 310–326: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 49–53
- Decision Matrix — Student Work Pages, PDF pages 77–78
- Redesigning Your Protective Device — Student Work Pages, PDF pages 79–80
- Stakeholder Feedback Form — Student Work Pages, PDF pages 81–84
- Reference: Additional Material Considerations Matrix — Student Procedure Guide, PDF page 76

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation: How can we use our science ideas and other societal wants and needs to refine our designs?

Lesson 15: How can we use what we figured out to evaluate another engineer's design?

LESSON QUESTION

How can we use what we figured out to evaluate another engineer's design?

Plan about **2 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 327–335: the steps, materials and timing for this lesson.

Student pages to print

- Student procedures for this lesson — Student Procedure Guide, PDF pages 54–55
- Final Design Proposal — Student Work Pages, PDF pages 85–88
- Reviewing Our Driving Question Board — Student Work Pages, PDF pages 89–90

For the teacher

- Teacher Reference — Teacher Guide, PDF pages 406–417
- Answer Key — Teacher Guide, PDF pages 418–421

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation:
How can we use what we figured out to evaluate another engineer's design?

Lesson 16: OPTIONAL How can we market our designs to our potential investors?

LESSON QUESTION

OPTIONAL How can we market our designs to our potential investors?

Plan about **4 class days** for this lesson.

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 336–341: the steps, materials and timing for this lesson.

Student pages to print

- Creating a Scale Model — Student Work Pages, PDF pages 91–94
- Determining Your Prototype Testing Conditions — Student Work Pages, PDF pages 95–98
- Investor Design Feedback Form — Student Work Pages, PDF pages 99–100
- Outlining an Investor Pitch Presentation — Student Work Pages, PDF pages 101–108
- Determine Your Presentation Format — Student Work Pages, PDF pages 109–110
- Optional Project Extensions — Student Work Pages, PDF pages 111–112

For the teacher

- Teacher Reference — Teacher Guide, PDF pages 422–423
- Teacher Reference 1 — Teacher Guide, PDF pages 424–427
- Teacher Reference 2 — Teacher Guide, PDF pages 428–435

Check for understanding

- Explain your answer to the lesson question, using evidence from your investigation:
OPTIONAL How can we market our designs to our potential investors?

Reading: Science Literacy Collection 6

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 342–348: the steps, materials and timing for this lesson.

Student pages to print

- Exercise Page 6 — Student Work Pages, PDF pages 123–127

Check for understanding

WORDS QUIZ

Contact Forces

Name: _____ Date: _____

Circle the letter of the best answer.

1. Which word means “matter that does not hold a fixed shape and is able to flow; gases and liquids”?
 - a) fluid
 - b) gravity
 - c) deform
 - d) law of conservation of energy
2. Which word means “to plan and/or make something for a specific purpose or use”?
 - a) design
 - b) fluid
 - c) concussion
 - d) newton
3. Which word means “the capacity to do work”?
 - a) energy
 - b) speed
 - c) projectile
 - d) concussion
4. Which word means “capable of recovering size and shape after being deformed”?
 - a) elastic
 - b) acceleration
 - c) mass
 - d) load
5. Which word means “a brain injury that occurs when the head is struck by, or strikes, another object or surface, causing the brain to strike the inside of the skull”?
 - a) projectile
 - b) criteria
 - c) concussion
 - d) flexible
6. Which word means “the amount of force that is spread out over a certain area”?
 - a) malleable
 - b) practical limit
 - c) distribution of force
 - d) elastic limit

- 7.** Which word means “a change in velocity”?
- a) design
 - b) acceleration
 - c) practical limit
 - d) gravity
- 8.** Which word means “the resistance of motion between objects or materials that are in contact”?
- a) collision
 - b) friction
 - c) breaking point
 - d) symmetrical
- 9.** Which word means “a force per unit area in a material that is experiencing an external force”?
- a) rigid
 - b) peak force
 - c) stress
 - d) practical limit
- 10.** Which word means “during a collision, the measure of force at the instant in which the force is greatest”?
- a) peak force
 - b) contact force
 - c) elastic limit
 - d) constraint
- 11.** Which word means “a body thrown forward by external thrust that also continues forward motion by its own inertia”?
- a) model
 - b) terminal velocity
 - c) projectile
 - d) load
- 12.** Which word means “the maximum stress a material can withstand without permanent deformation”?
- a) contact force
 - b) elastic limit
 - c) distribution of force
 - d) op-ed

FOR THE TEACHER

Answers

Unit quiz key

1. a 2. a 3. a 4. a 5. c 6. c 7. b 8. b 9. c 10. a 11. c 12. b