

# Tennessee Comprehensive Assessment Program

# TCAP

TNReady—Science  
Grade 7 Item Release





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# Metadata Interpretation Guide – Science

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**Item Information**

Item Code: TNS10220	Passage Title:
Standard Code: 0307.1.1	Passage Code:
Standard Text: Identify specific parts of a plant and describe their function.	
Reporting Category: Cells, Flow of Matter & Energy, Heredity	
Correct Answer: B	DOK Level: 2

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<b>Item Code:</b> Unique letter/number code used to identify the item.	<b>Passage Title:</b> (if listed): Title of the passage(s) associated with this item.
<b>Standard Code:</b> Primary educational standard assessed.	<b>Passage Code:</b> (if listed): Unique letter/number code used to identify the passage(s) that go with this item.
<b>Standard Text:</b> Text of the educational standard assessed.	
<b>Reporting Category:</b> Text of the Reporting Category the standard assesses.	
<b>Correct Answer:</b> Correct answer. This may be blank for constructed response items where students write or type their responses.	<b>DOK Level</b> (if listed): Depth of Knowledge (cognitive complexity) is measured on a four-point scale. 1= Recall; 2= Skill/Concepts; 3= Strategic Thinking; 3-4 = Strategic/Extended Thinking

# Science Grade 7

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## Item Information

Item Code:	TNS02097	Passage Title:	
Standard Code:	0707.1.1	Passage Code:	
Standard Text:	Identify and describe the function of the major plant and animal cell organelles.		
Reporting Category:	Cells, Flow of Matter & Energy		
Correct Answer:	D	DOK Level:	1

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**What cell organelle produces energy in animal cells?**

- A** vacuole
- B** lysosome
- C** ribosome
- D** mitochondrion

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**Item Information**

Item Code: TNS10466

Passage Title:

Standard Code: 0707.1.3

Passage Code:

Standard Text: Explain the basic functions of a major organ system.

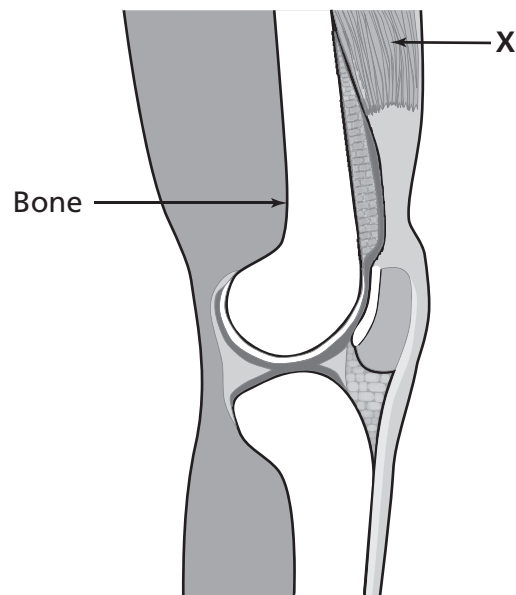
Reporting Category: Cells, Flow of Matter & Energy

Correct Answer: A

DOK Level: 2

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The illustration shows structures from certain body systems.



What is the main function of the structure labeled X?

- A moving the body
- B forming blood cells
- C supporting the body
- D transmitting nerve impulses

**Item Information**

Item Code: TNS20854

Passage Title:

Standard Code: 0707.1.3

Passage Code:

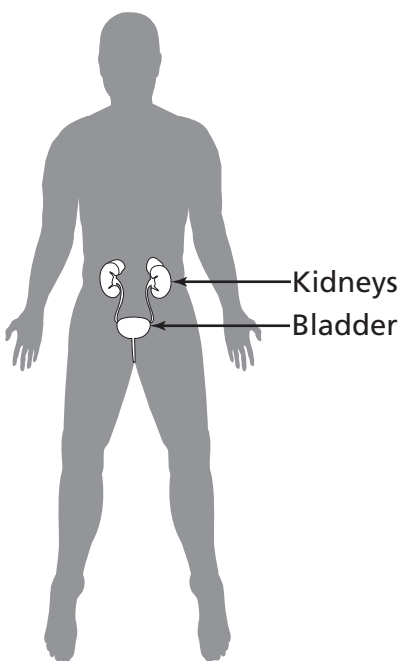
Standard Text: Explain the basic functions of a major organ system.

Reporting Category: Cells, Flow of Matter &amp; Energy

Correct Answer: C

DOK Level: 2

A system from the human body is shown in the diagram.



What is a main function of this organ system?

- A providing nutrients to cells
- B transporting oxygen to cells
- C removing wastes
- D producing offspring

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**Item Information**

Item Code: TNS20755

Passage Title:

Standard Code: 0707.1.4

Passage Code:

Standard Text: Sequence a series of diagrams that depict chromosome movement during plant cell division.

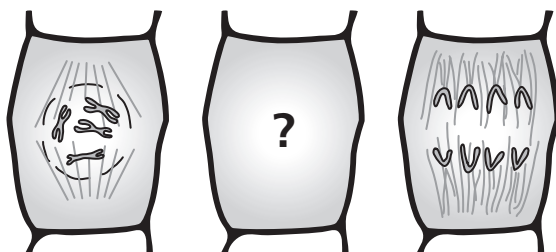
Reporting Category: Cells, Flow of Matter & Energy

Correct Answer: C

DOK Level: 2

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The diagram shows two phases in plant cell division.

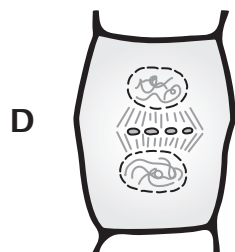
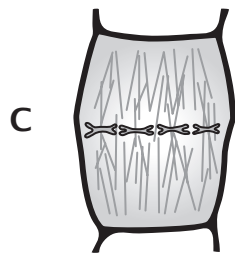
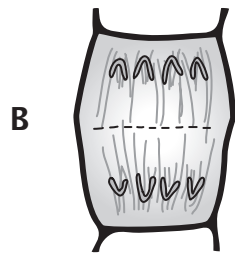
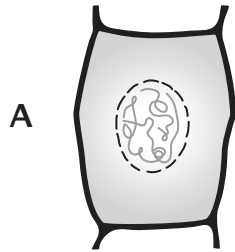


*(This item continues on the next page.)*



(Item 4, continued from the previous page)

Which phase occurs between the two phases shown above?



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**Item Information**

Item Code: TNS20764	Passage Title:
Standard Code: 0707.11.1	Passage Code:
Standard Text: Differentiate between the six simple machines.	
Reporting Category: Motion	
Correct Answer: B	DOK Level: 2

---

**Workers need to move some heavy tools to a roof several meters above the ground. Which simple machine would best help the workers lift the tools?**

- A** a wedge
- B** a pulley
- C** a lever
- D** a screw

---

**Item Information**

Item Code: TNS00286	Passage Title:
Standard Code: 0707.11.1	Passage Code:
Standard Text: Differentiate between the six simple machines.	
Reporting Category: Motion	
Correct Answer: C	DOK Level: 1

---

**Jonas uses a pair of scissors to cut a piece of paper in half.**

**What simple machine is used to cut the paper?**

- A** pulley
- B** screw
- C** wedge
- D** wheel and axle

---

**Item Information**

Item Code: TNS10044	Passage Title:
Standard Code: 0707.11.2	Passage Code:
Standard Text: Determine the amount of force needed to do work using different simple machines.	
Reporting Category: Motion	
Correct Answer: A	DOK Level: 2

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**A person performed 100 newton-meters of work by moving an object into a truck with a ramp 5 meters long.**

$\text{Force } (f) = \text{Work } (w) \div \text{Distance } (d)$
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**How much force was needed to move the object into the truck?**

- A** 20 newtons
- B** 95 newtons
- C** 105 newtons
- D** 500 newtons

**Item Information**

Item Code: TNS10485

Passage Title:

Standard Code: 0707.11.4

Passage Code:

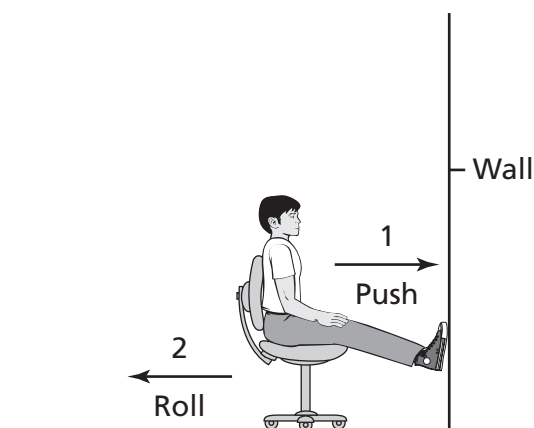
Standard Text: Identify and explain how Newton's laws of motion relate to the movement of objects.

Reporting Category: Motion

Correct Answer: D

DOK Level: 2

A person sits in a chair with wheels. He pushes on a wall with his legs and applies a force directly to the wall. The push force causes an applied force in the opposite direction, as shown in the picture below.



Which scientific principle best identifies why the person moves away from the wall?

- A the law of gravity
- B the principle of inertia
- C Newton's second law of motion
- D Newton's third law of motion

Item Information

Item Code: TNS20539

Passage Title:

Standard Code: 0707.11.5

Passage Code:

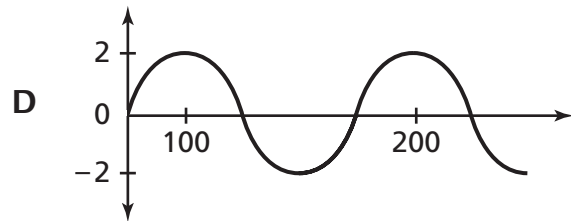
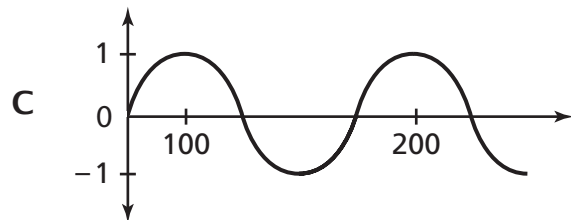
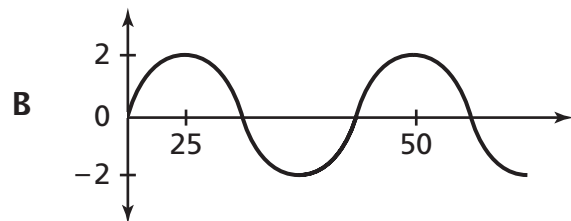
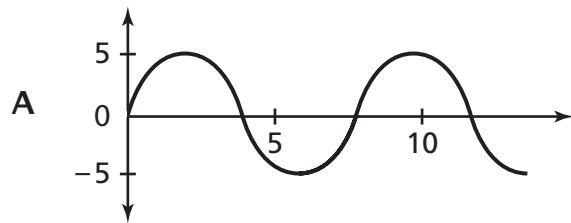
Standard Text: Compare and contrast the different parts of a wave.

Reporting Category: Motion

Correct Answer: A

DOK Level: 2

Which wave has the greatest amplitude?



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**Item Information**

Item Code: TNS10576

Passage Title:

Standard Code: 0707.11.6

Passage Code:

Standard Text: Differentiate between transverse and longitudinal waves in terms of how they are produced and transmitted.

Reporting Category: Motion

Correct Answer: B

DOK Level: 2

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**A book falls off a desk and makes a sound when it hits the floor. The sound wave that travels through the air**

- A** is a transverse wave.
- B** is a longitudinal wave.
- C** moves in one direction from the source.
- D** moves faster than the speed of light.

---

**Item Information**

Item Code:	TNS10031	Passage Title:	
Standard Code:	0707.3.1	Passage Code:	
Standard Text:	Compare the chemical compounds that make up the reactants and products of photosynthesis and respiration.		
Reporting Category:	Cells, Flow of Matter & Energy		
Correct Answer:	C	DOK Level:	2

---

**Which statement accurately describes the relationship between photosynthesis and respiration?**

- A** Both processes produce water ( $\text{H}_2\text{O}$ ).
- B** Both processes produce oxygen ( $\text{O}_2$ ).
- C** Carbon dioxide ( $\text{CO}_2$ ) produced by respiration is needed for photosynthesis.
- D** Glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) is a reactant for photosynthesis and a product of respiration.



**Item Information**

Item Code: TNS20562

Passage Title:

Standard Code: 0707.3.2

Passage Code:

Standard Text: Interpret a diagram to explain how oxygen and carbon dioxide are exchanged between living things and the environment.

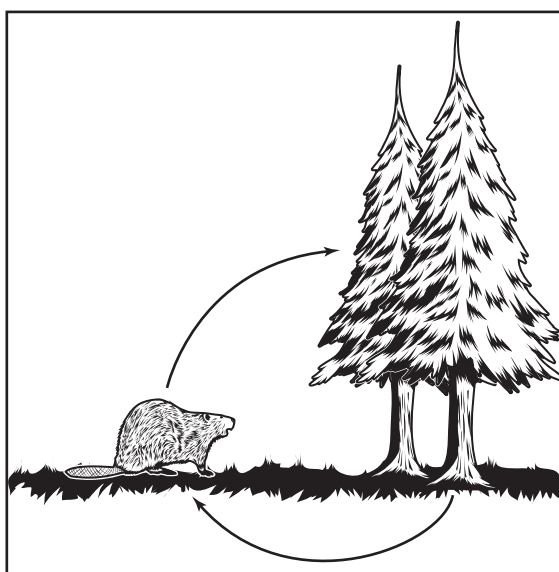
Reporting Category: Cells, Flow of Matter &amp; Energy

Correct Answer: B

DOK Level: 2

The arrows in the diagram represent gases exchanged between plants and animals.

**Gas Exchange**



Which statement best explains this gas exchange?

- A Animals produce oxygen that plants release.
- B Animals release carbon dioxide that plants use in photosynthesis.
- C Plants produce carbon dioxide that animals use to produce oxygen.
- D Plants release oxygen that animals use to produce chlorophyll.

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**Item Information**

Item Code: TNS20563	Passage Title:
Standard Code: 0707.4.1	Passage Code:
Standard Text: Classify methods of reproduction as sexual or asexual.	
Reporting Category: Heredity	
Correct Answer: A	DOK Level: 1

---

**The union of a sperm and an egg during the life cycle of a jellyfish is best described as**

- A** sexual reproduction.
- B** genetic inheritance.
- C** asexual reproduction.
- D** genetic engineering.

---

**Item Information**

Item Code: TNS10035	Passage Title:
Standard Code: 0707.4.1	Passage Code:
Standard Text: Classify methods of reproduction as sexual or asexual.	
Reporting Category: Heredity	
Correct Answer: B	DOK Level: 2

---

Which is the best example of sexual reproduction?

- A** A new plant cell results from mitosis.
- B** Offspring receive genetic material from two parents.
- C** A bacterium divides into offspring identical to the parent.
- D** Daughter cells receive all the genetic material of a parent cell.

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**Item Information**

Item Code: TNS10270

Passage Title:

Standard Code: 0707.4.2

Passage Code:

Standard Text: Match flower parts with their reproductive functions.

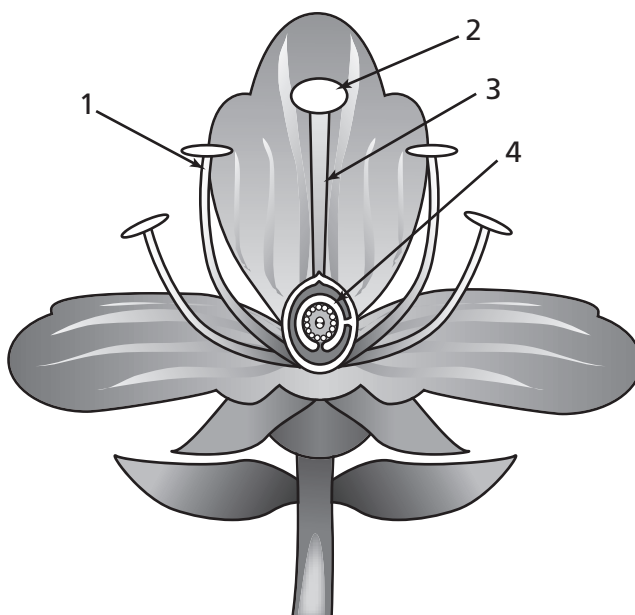
Reporting Category: Heredity

Correct Answer: D

DOK Level: 2

---

**The diagram shows a flower.**



**Which arrow points to the part of the flower where the seeds develop?**

- A** 1
- B** 2
- C** 3
- D** 4

**Item Information**

Item Code: TNS10563

Passage Title:

Standard Code: 0707.7.1

Passage Code:

Standard Text: Use a table of physical properties to classify minerals.

Reporting Category: The Earth

Correct Answer: A

DOK Level: 2

Students examine a soft, white mineral with a distinct odor. The students compare their observations with the properties in the table below.

**Physical Characteristics of Minerals**

Name	Hardness	Color	Odor
Talc	1	White	Earthy
Sulfur	2	Yellow	Rotten Eggs
Gypsum	2	Colorless	None
Calcite	3	White	None
Amethyst	7	Purple	None
Quartz	7	Colorless	None
Emerald	8	Green	None
Diamond	10	Colorless	None

Based on the table, which mineral did the students observe?

- A Talc
- B Sulfur
- C Calcite
- D Quartz

---

**Item Information**

Item Code: TNS10479	Passage Title:
Standard Code: 0707.7.3	Passage Code:
Standard Text: Identify the major processes that drive the rock cycle.	
Reporting Category: The Earth	
Correct Answer: C	DOK Level: 1

---

**Which process can transform a sedimentary rock into a metamorphic rock?**

- A** melting and cooling
- B** deposition and cementation
- C** heat and pressure
- D** evaporation and condensation

---

**Item Information**

Item Code: TNS20490

Passage Title:

Standard Code: 0707.7.3

Passage Code:

Standard Text: Identify the major processes that drive the rock cycle.

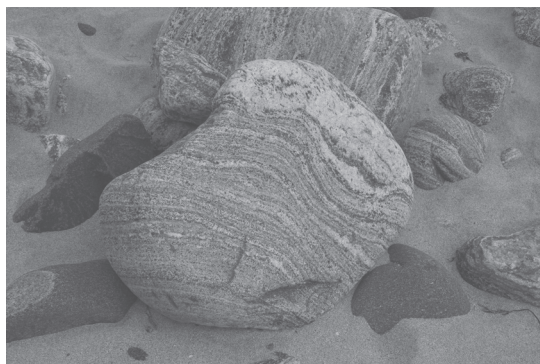
Reporting Category: The Earth

Correct Answer: C

DOK Level: 1

---

**Gneiss is a metamorphic rock that can form from granite.**



**What must occur in order for granite to form gneiss?**

- A** weathering and erosion
- B** melting and cooling
- C** high temperature and pressure
- D** transportation and deposition

---

**Item Information**

Item Code: TNS10565	Passage Title:
Standard Code: 0707.7.3	Passage Code:
Standard Text: Identify the major processes that drive the rock cycle.	
Reporting Category: The Earth	
Correct Answer: B	DOK Level: 1

---

**Which of these can transform metamorphic rock into igneous rock?**

- A** heat and pressure
- B** melting and cooling
- C** pressure and melting
- D** deposition and cementation



**Item Information**

Item Code: TNS10349	Passage Title:
Standard Code: 0707.7.4	Passage Code:
Standard Text: Differentiate among the characteristics of the earth's three layers.	
Reporting Category: The Earth	
Correct Answer: D	DOK Level: 1

---

**Which layer of Earth has the least density?**

- A** inner core
- B** outer core
- C** mantle
- D** crust

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**Item Information**

Item Code: TNS10276	Passage Title:
Standard Code: 0707.7.4	Passage Code:
Standard Text: Differentiate among the characteristics of the earth's three layers.	
Reporting Category: The Earth	
Correct Answer: C	DOK Level: 1

---

**In which layer of Earth are the temperature and pressure the highest?**

- A** crust
- B** mantle
- C** inner core
- D** outer core

**Item Information**

Item Code: TNS20446

Passage Title:

Standard Code: 0707.7.5

Passage Code:

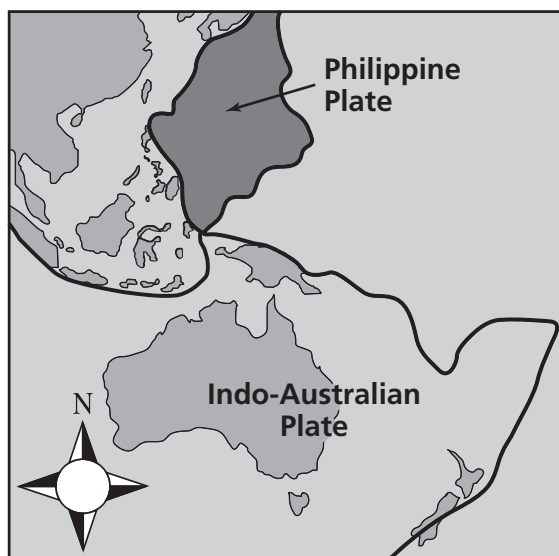
Standard Text: Recognize that lithospheric plates on the scale of continents and oceans continually move at rates of centimeters per year.

Reporting Category: The Earth

Correct Answer: A

DOK Level: 2

As the Indo-Australian Plate moves toward the northeast, it collides with the Philippine Plate.



Which best describes the annual rate of movement of the Indo-Australian Plate?

- A 6.7 centimeters
- B 67 meters
- C 6.7 millimeters
- D 67 kilometers

---

**Item Information**

Item Code: TNS10355	Passage Title:
Standard Code: 0707.7.7	Passage Code:
Standard Text: Analyze and evaluate the impact of man's use of earth's land, water, and atmospheric resources.	
Reporting Category: The Earth	
Correct Answer: D	DOK Level: 2

---

**Which human activity greatly increases the amount of carbon dioxide that is released into the atmosphere?**

- A** planting trees
- B** composting leaves
- C** draining wetlands
- D** burning coal

**Item Information**

Item Code:	TNS00228	Passage Title:	
Standard Code:	0707.Inq.1	Passage Code:	
Standard Text:	Design a simple experimental procedure with an identified control and appropriate variables.		
Reporting Category:	Inquiry and Technology & Engineering		
Correct Answer:	D	DOK Level:	2

---

**A scientist wants to know if female guppies prefer to mate with male guppies when the males are more colorful. She divides a fish tank in half using a glass divider. She then places a female guppy in one side of the tank and takes turns placing differently-colored male guppies in the other side. She observes the response the female has to each male guppy.**

**What is the dependent variable in this investigation?**

- A** size of the male guppies
- B** color of the male guppies
- C** amount of time each male is in the tank
- D** female response to each male in the tank

---

**Item Information**

Item Code: TNS10893	Passage Title:
Standard Code: 0707.TE.2	Passage Code:
Standard Text: Evaluate a protocol to determine if the engineering design process was successfully applied.	
Reporting Category: Inquiry and Technology & Engineering	
Correct Answer: A	DOK Level: 3-4

---

**A company is manufacturing a platform to help painters reach high places. The platform is supposed to support up to 3,000 N. Which is the best way for the company to test the platform to make sure it supports the weight for which it was designed?**

- A** place objects on the platform that are slightly greater than 3,000 N
- B** place objects on the platform that are slightly less than 3,000 N
- C** release the platform holding 3,000 N from a given height
- D** drop 3,000-N objects from a given height onto the platform

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