

STEM Basketball Assessment - th-8th Grades

Module 1.1: BASKETBALL MEASUREMENTS

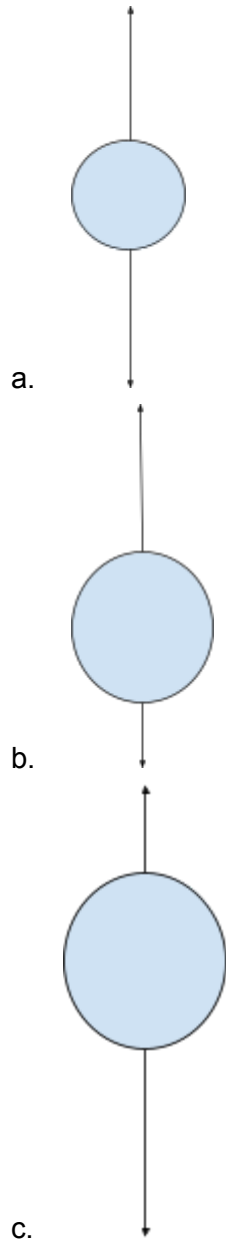
1. Jose is trying to make a scale drawing of the locker room. He knows that the dimensions of the room are 48 feet long by 35 feet wide. If he is using a 2 foot to 0.5 inch for his scale drawing, how long will the drawing be?
 - a. 24 inches
 - b. 12 inches
 - c. 6 inches
 - d. 48 inches

2. Which of the following demonstrates equal portions?
 - a. $\frac{1}{2} = \frac{3}{4}$
 - b. $\frac{1}{2} = \frac{1}{4}$
 - c. $\frac{2}{2} = \frac{3}{4}$
 - d. $\frac{1}{2} = \frac{2}{4}$

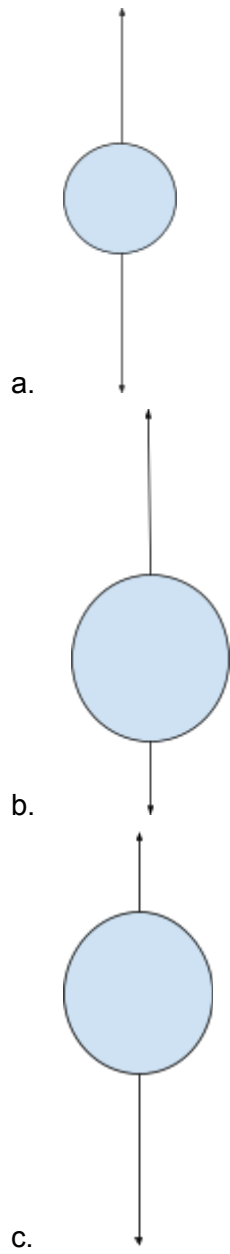
3. In order to determine if two basketball backboards (or two objects) are portionally related, which of the following is NOT a way to determine if they are portional?
 - a. Divide the width by the height of each object
 - b. Find the area of each
 - c. Set up the dimension as fraction and determine if the fractions are equal
 - d. Divide the height by the width of each object

Module 2.1: SCIENCE OF BASKETBALL

1. Which force diagram demonstrates a basketball moving up?



2. Which force diagram demonstrates a basketball falling down?



3. Which example does NOT describe an object undergoing an equal and opposite reaction?
- a. A person jumping into the water doing a cannonball
 - b. A person pushing a car
 - c. A person jumping off the ground
 - d. A person free falling during skydiving

Module 3.1: UNDERSTANDING BASKETBALL

1. True or False: Temperature cannot change the physical properties of matter.
2. How does the molecular motion of an object change?
 - a. When a basketball is heated the molecules slow down, when it is cooled they speed up.
 - b. When a basketball is heated the molecules speed up, when it is cooled they slow down.
 - c. When a basketball is heated the molecules speed up, when it is cooled they speed up.
 - d. When a basketball is heated the molecules slow down, when it is cooled they slow down.
3. Predict which of the following situations would improve the performance of a basketball to proper inflation.
 - a. The ball is overfilled but at night the air cools down.
 - b. The ball is underfilled but at night the air cools down.
 - c. The ball is filled correctly and the temperature during the day warms up.
 - d. The ball is overfilled and the temperature during the day warms up.

Module 4.1: VELOCITY AND ACCELERATION

1. What is the difference between velocity and acceleration?
 - a. Velocity is speed with direction and acceleration is change in velocity.
 - b. Both are how fast something is traveling.
 - c. Acceleration is speed and velocity is speed with direction.
 - d. Velocity is measured in meters per second and acceleration is in feet per minute.

2. How can you determine the force applied to a basketball?
 - a. Measure the mass and divide it by speed.
 - b. Measure the mass and divide it by the height.
 - c. Measure the mass and multiply it by the acceleration.
 - d. Divide gravity by 2 and multiply it by mass.

Module 5.1: ENGINEERING DESIGN CHALLENGE

1. Which of the following is an essential reason to collect data when testing a design?
 - a. To determine the overall success of the design.
 - b. To prove your design was the best.
 - c. To measure how long it will work.
 - d. To compare your initial design and redesign.

2. When should you redesign?
 - a. As you are building the original design.
 - b. After you are beginning research.
 - c. After collecting data during the test.
 - d. As you are testing the original design.

3. In basketball, coaches use the design process to create new plays. What should the coach do first?
 - a. Try out a plan
 - b. Identify the problem
 - c. Brainstorm multiple ideas with the team
 - d. Research what other coaches are doing

Module 6.1: CALCULATING CALORIES

1. What part of the cell turns glucose to ATP (energy)?
 - a. Nucleus
 - b. Ribosome
 - c. Mitochondria
 - d. Golgi body

2. In the WNBA, Candace Parker weighs 175 pounds and plays approximately 30 minutes per game. How many calories will she burn during her playing time in a WNBA season (82 games)?

Example: Lebron James: $(250\text{lbs} \div 2) \times 7 \times .5 \text{ hours} = 437.5 \text{ Calories Burned}$.

- a. 25,112 calories
- b. 35, 875 calories
- c. 50, 225 calories
- d. 71, 750 calories

Module 7.2: SHOT TRACKING WITH TECHNOLOGY

1. If you have a 60% success rate for free throws, how many total points will you score if you attempt 20 shots?
 - a. 10
 - b. 12
 - c. 14
 - d. 16

2. Which of the following has the strongest evidence supporting the claim about a player's free throw ability?
 - a. Player one has a 0.88 probability of making free throws shots. Player one should take the free throw for the team.
 - b. Player two is the tallest and been playing basketball the longest. Player two should take the free throw for the team.
 - c. Player three has a 45% percent chance of making a 3-point shot. Player three should take the free throw for the team.
 - d. Player four makes almost every shot he/she attempts. Player four should take the free throw for the team.

Module 8.1: ADVANCEMENTS IN SHOE TECHNOLOGY

1. In analyzing technology, which of the following is the best way to collect information?
 - a. Take measurements and test the equipment
 - b. Record the color and style
 - c. Note how the cost has changed over time
 - d. Look it up online

2. What data is most effective to evaluate and improve the performance of shoes?
 - a. Quantitative
 - b. Attribute
 - c. Qualitative
 - d. Discrete

KEY

Module 1.1: BASKETBALL MEASUREMENTS

1. B
2. D
3. B

Module 2.1: SCIENCE OF BASKETBALL

1. B
2. C
3. D

Module 3.1: UNDERSTANDING BASKETBALL

1. F
2. B
3. A

Module 4.1: VELOCITY AND ACCELERATION

1. A
2. C

Module 5.1: ENGINEERING DESIGN CHALLENGE

1. A
2. C
3. B

Module 6.1: CALCULATING CALORIES

1. C
2. A

Module 7.2: SHOT TRACKING WITH TECHNOLOGY

1. B
2. A

Module 8.1: ADVANCEMENTS IN SHOES TECHNOLOGY

1. A
2. A