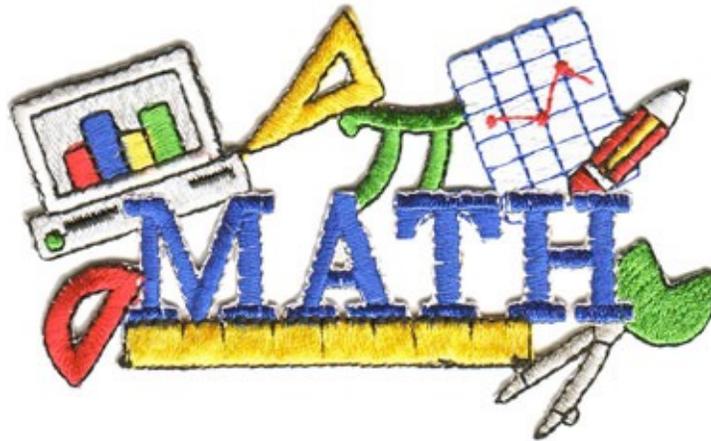


7th Grade Math

Benchmark 3

Parent Handbook



This handbook will help your child review material learned this quarter, and will help them prepare for their third Math Benchmark Test. Please allow your child to work independently through the material, and then you can check their work using the answer key in the back of the handbook. If you have any questions or concerns about this material, please contact your child's teacher. Thank you for your support.

Seventh Grade Benchmark #3

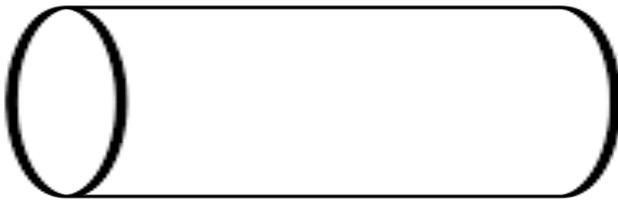
Math Essential Standards

Learning Objective #1:

 "Describe the two-dimensional figures that result from slicing three-dimensional figures."

Practice:

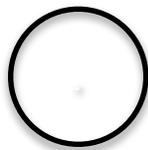
1. If you look at this object from the left, what shape would you see?



- a. a cylinder
- b. a circle
- c. a rectangle
- d. a triangle

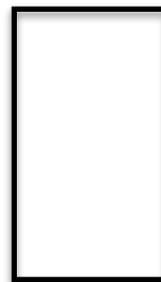
2. What is the solid with the given cross sections?

Cross Section Parallel to Base:



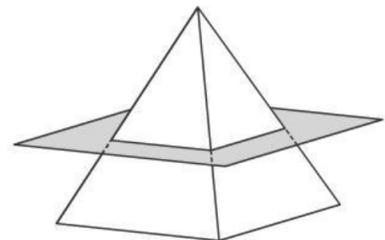
- a. a cone
- b. a sphere
- c. a cylinder
- d. a circle

Cross Section Perpendicular to Base:



3. A right rectangular pyramid is sliced parallel to its base as shown in the figure. What is the shape of the resulting two-dimensional cross section?

- a. a trapezoid
- b. a triangle
- c. a rectangle



Learning Objective #2:

📍 “Solve mathematical problems and problems in a real-world context involving area, of two-dimensional objects composed of triangles, quadrilaterals, and other polygons. Solve mathematical problems and problems in real-world context involving volume and surface area of three-dimensional objects composed of cubes and right prisms.”

Practice:

4. What is the surface area of a wooden box whose shape is a cube if each side has an area of 13 ft?

- a. 52 square feet
- b. 78 square feet
- c. 312 square feet
- d. 156 square feet

5. Sandy brought a rectangular recycling bin for her office. The recycling bin has length of 7 centimeter, a width of 10 centimeter, and a height of 12 centimeter.

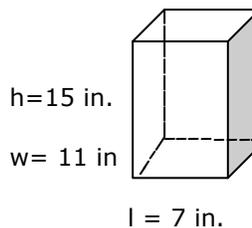
What is the surface area of the recycling bin?

- a. 840 cm²
- b. 840 cm³
- c. 548 cm
- d. 548 cm²

6. Which formula will allow Steve to correctly compute the surface area of a cube with the side a?

- a. 6a
- b. 12a
- c. 6a²
- d. a³

7. What is the surface area of the rectangular prism below?



Learning Objective # 3:

 “ Solve mathematical problems and problems in a real-world context involving area, of two-dimensional objects composed of triangles, quadrilaterals, and other polygons. Solve mathematical problems and problems in real-world context involving volume and surface area of three-dimensional objects composed of cubes and right prisms.”

Practice:

8. What is the volume of a wooden box whose shape is a cube if the edge of the box is 4 cm?

- a. 16 cm^3
- b. 64 cm^2
- c. 16 cm^2
- d. 64 cm^3

9. Jordon purchased a box that he filled with liquid candle wax. One side of the box has an area of 12 meters and it is 6 meters long. What is the volume of the rectangular box?

- a. 72 cm^3
- b. 864 cm^3
- c. 72 cm^2
- d. 18 cm^3

10. A box has dimensions 6 in \times 3 in \times 7 in. What is the volume?

- a. 162 in^3
- b. $4,096 \text{ in}^3$
- c. 126 in^3
- d. 32 in^3

11. If the box from Question #10 is cut into half to make two triangular prisms, what is the volume of each triangular prism?

Learning Objective #4:

 **“Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. ”**

Practice:

12. Lego shipped 285 kits to Walmart. Lego decided to randomly check the kits for missing pieces. Of the 30 randomly selected kits, 4 had missing pieces. Predict the number of kits, in all, that are expected to have missing pieces.

- a. 76 kits
- b. 38 kits
- c. 19 kits
- d. 152 kits

13. The table provided represents the number of students wearing different types of sports shoes in physical education class. If there are 230 students on the field at lunch, predict how many of those students will be wearing Converse.

Sports Shoes	Nike	Adidas	Converse	Puma
Number of Students	11	9	12	5

- a. 75 students
- b. 31 students
- c. 74 students
- d. 68 students

14. Using the table from Question #13, if there are 230 students on the field at lunch, predict how many of those student will be wearing Puma.

15. Veterinary doctors marked 30 deer and released them. Later on, they counted 150 deer, 12 of which had marks. To the nearest whole number, what is the best estimate for the deer population?

Learning Objective #5:

 **“Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.”**

Practice:

16. Suzie has cards numbers 9 – 21 in a bag. What is the probability she will pull a card lower than 17?

- a. $\frac{8}{12}$
- b. $\frac{8}{13}$
- c. $\frac{2}{3}$
- d. $\frac{9}{13}$

17. Using the same cards from the above question, she pulls one card out without looking and replaces after each pull. She performs this experiment a total of 50 times. About how many times should Suzie expect to pull out a card that is a multiple of two?

- a. 12 times
- b. 15 times
- c. 23 times
- d. 10 times

18. A standard coin has two sides. One side is tails and the other side is heads. A count is tossed 60 times. Using theoretical probability, predict the number of times the coin will land on heads?

19. A standard coin has two sides. One side is tails and the other side is heads. A count is tossed 60 times. If the coin lands on heads 25 times, what is the experimental probability?

Benchmark 3 Essential Math Vocabulary

- ◆ **3D solids** - A term used to describe figures having length, width and depth.
- ◆ **2D shapes** - A term used to describe plane figures in which only the length and the width can be measured. Shapes are on a flat surface or plane; there is no thickness.
- ◆ **dimensions** - Refers to those properties called length, area, and volume. A configuration (line) having length only is said to have one dimension; a figure (flat surface) having area is said to have two dimensions (length and width); and a solid shape having volume is said to have three dimension (length, width, and height).
- ◆ **slice** - To cut (something) into pieces or slices.
- ◆ **prism** - A 3D figure with two parallel polygonal bases that are the same shape and the same size.
- ◆ **surface area** - The sum of the areas of all faces of a solid figure. The formula to find the surface area of a right prism is $SA = 2B + Ph$, where B equals the area of one base, P equals the perimeter of one base, and h equals the height of the prism.
- ◆ **volume** - The measurement of the amount of space contained in a solid figure. Determining the volume of a space is equivalent to finding out how many standard cubic units it takes to fill that space. The formula to find the volume of a right prism is $V = Bh$, where B equals the area of the base and h equals the height of the prism.
- ◆ **cylinder** - A tubular solid with a circular bases.
- ◆ **cube** - A rectangular prism with six congruent square faces.
- ◆ **triangular prism** - A polyhedron with two parallel, congruent polygons which are triangles being its bases and all the other faces being parallelograms.

Benchmark 3 Essential Math Vocabulary

- ◆ **right pyramid** - A solid figure with one face a polygon (the base) and the other faces being triangles that all share the same vertex. A line from the vertex to the center of the base polygon is called the axis of the pyramid. When this axis is perpendicular to the base, the pyramid is called a right pyramid.
- ◆ **formula** - Is an expression or equation that expresses a relationship between certain quantities.
- ◆ **sample** - A part of the total population used in statistics to make predictions about the characteristics of the entire group.
- ◆ **biased sample** - A sample in which individuals or groups from the population are not represented in the sample.
- ◆ **unbiased sample** - A sample in which every individual or the element in the population has an equal chance of being selected.
- ◆ **stratified sample** - An unbiased sampling technique used by taking samples from each sub-group of a population.
- ◆ **systematic sample** - An unbiased sampling technique using a fixed starting point and a constant interval between samples.
- ◆ **inference** - A conclusion drawn from given information, many times in the form of data.
- ◆ **probability** - The measure of the likelihood of the occurrence of an event.
- ◆ **proportion** - The statement of equality between two ratios.

Math ANSWER KEY

1. B

2. C

3. C

4. B

5. D

6. C

7. 694 square inches

8. D

9. A

10. C

11. 63 in³

12. B

13. A

14. 31 students

15. 375 deer

16. B

17. C

18. 30 times

19. 5/12