

DIRECTIONS Complete the guided highlighted reading. Then read the text, paying attention to what you highlighted. Finally, answer the questions about the selection.

Cubes and Cube Roots

Adapted from <http://www.mathsisfun.com/numbers/cube-root.html>

Guided Highlighted Reading

Box 1: Highlight how to cube a number.

Box 1: Highlight 3^3 and the answer.

Box 1: Highlight more cubes and their answers.

Box 2: Highlight what the cube root of a number is.

Box 2: Highlight what you should think when you see "root".

Box 2: Highlight more cubes and cube roots.

Box 3: Highlight the special symbol.

Box 3: Highlight what you can also cube.

Box 4: Highlight what perfect cubes are.

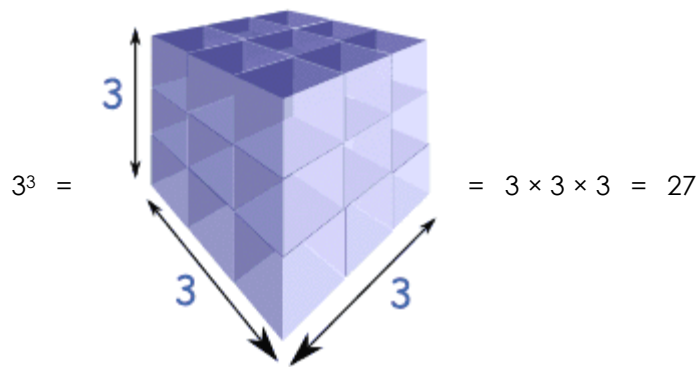
Box 4: Highlight the table of perfect cubes.

Box 4: Highlight the example and the answer.

1 How to Cube A Number

To **cube** a number, multiply the number three times.

Example: What is 3^3 ?



More Cubes

$$4^3 = 4 \times 4 \times 4 = 64$$

$$5^3 = 5 \times 5 \times 5 = 125$$

$$6^3 = 6 \times 6 \times 6 = 216$$

Guided Highlighted Reading

2 Cube Root

A **cube root** goes the other direction: 3^3 is 27, so the cube root of 27 is 3.



The cube root of a number is a special value that when cubed gives the original number. The cube root of 27 is 3, because when 3 is cubed you get 27.



Note: When you see "root", think "I know the tree, but what is the root that produced it?" In this case the tree is "27", and the cube root is "3".

More Cubes and Cube Roots



4		64
5		125
6		216

Example: What is the Cube root of 125?

We know that $125 = 5 \times 5 \times 5$, so the answer is 5.

3 The Cube Root Symbol



This is the special symbol that means "cube root", it is the "**radical**" symbol (used for square roots) with a little three to mean **cube** root.

$$\sqrt[3]{27} = 3$$

You can use it like this:

You would say "the cube root of 27 equals 3".

You can also cube negative numbers:

If you cube 5 you get 125: $5 \times 5 \times 5 = 125$

If you cube -5 you get -125: $-5 \times -5 \times -5 = -125$

$$\sqrt[3]{-125} = -5$$

Guided Highlighted Reading

4 Perfect Cubes

The perfect cubes are the cubes of the whole numbers:

x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Perfect Cubes:	1	8	27	64	125	216	343	512	729	1000	1331	1728	2197	2744	3375

Example: What is the cube root of 30?

We know $3 \times 3 \times 3 = 27$ and $4 \times 4 \times 4 = 64$, so we can guess the answer is between 3 and 4.

- Let's try 3.5: $3.5 \times 3.5 \times 3.5 = 42.875$
- Let's try 3.2: $3.2 \times 3.2 \times 3.2 = 32.768$
- Let's try 3.1: $3.1 \times 3.1 \times 3.1 = 29.791$

$$\sqrt[3]{30} \approx 3.1$$

Answer the question in a well-written paragraph. Write in **complete sentences (1 pt)**. Make sure to include a **topic sentence (1/2 pt)** and **concluding sentence (1/2 pt)**. Include at least **two similarities** and **three differences each (1 pt each)**. It is worth 10 points.

Compare and contrast what you already know about squares and square roots with cubes and cube roots. You can use the thinking map to help organize your thoughts, but only your well-written paragraph will be graded.

