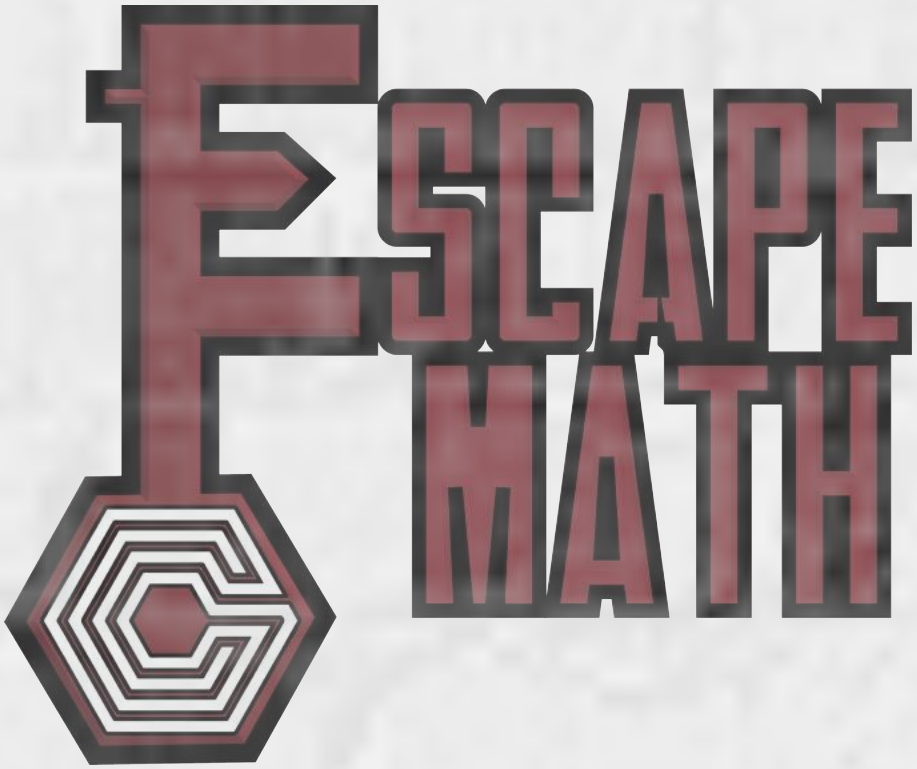
ORDER OF OPERATIONS



vocabulary/conceptual understanding/skill practice
small group activity

ORDER OF OPERATIONS

Ideal Unit: Operations & Variables	**Time Range:** 1 Period	**Supplies:** Envelopes, Pencil & Paper

Topics of Focus: Using the order of operations ranging from 3 steps to a challenging 10 step.

Common Core Alignment:

6.EE.2d	Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).

Procedures:

A.) You will need to determine the number of student groups you plan to have. This will work best with student groups of 3-5. You will need to have one set of envelopes and set of all the clues for each student group. You will need 4 envelopes for each student group. There are seven pages of clues. These will need to be cut apart in advance and placed in the correct envelopes. It would be wise to have an extra copy of this for you as teacher (not cut up).

B.) To begin, give each student group "Envelope 1". Students are given some pieces of clues that they will need later. Like in an Escape Room, this isn't always obvious. Let them struggle! If a group is falling behind, you can always provide a hint. After they have figured out how their clue fits together and solve the problems correctly. They will discover a "code". This is like a lock. Once they give you the correct code, you can give them their next envelop. If they are incorrect, you can make them wait 2 minutes before they can reapproach you. Can students escape the topic before time runs out? We'll find out.

As an option, you can use the Escape Math app for interactive locks! See the next page for links and the Class Code!

Options.) Should you want to have alternate endings, although the docs are not editable, you can use teacher magic tricks to change numbers to make different codes. I wouldn't recommend this until you've done the activity a few times. You may also find it works well to laminate the cutout and number them on the back with the envelope they are supposed to go in.

FOR INTERACTIVE LOCKS

CLASS CODE: 8-2-5-5

HTML

WANT A SPOOKY COUNTDOWN TIMER?

ESCAPE COUNTDOWN

CLICK THE BUTTONS TO GO THERE!

THE STORY

As an option, you can read this to your class to prepare them for the activity.

You've been taken in the middle of an ordinary day and are now locked in a math class. This isn't your fault – this is what the law tells us needs to happen. Unfortunately you are not allowed to leave until you have an understanding of the order of operations and demonstrate the skills. You have ____ minutes to do so. If you know a bit about National Landmarks, that can help.

There are four sets of envelopes with clues. You must determine the correct code to receive the next envelope. If you cannot Escape Math in the time allowed, you will be stuck in here forever.

ESCAPE MATH

VOCABULARY

Cut into 16 pieces **ENVELOPE 1**

Answer: as displayed

a. Sum	1. The result of adding a set of numbers.
b. Difference	7. The result of subtracting one number from another.
c. Product	0. The result of multiplying a set of numbers.
d. Quotient	4. The number that is the result of dividing one number by another number.
e. Exponent	3. The number, written as a small superscript, that tells the number of times the base is multiplied by itself.
f. Grouping Symbols	6. Parenthesis ( ), Brackets [ ], Absolute Value bars | | or Fraction Bars that group numbers together.
g. Simplify	5. To remove brackets, terms and numbers by performing operations.
h. PEMDAS	2. A mnemonic for the order of operations. Parenthesis, Exponents, Multiplication & Division (from L to R), then Addition & Subtraction (from L to R)

Cut out and place in **ENVELOPE 1**

1 VOCABULARY

Match the word with the definition. Substitute the numbers from the definition in for the correct letter. Simplify the expressions to get the four digit code.

a + b	c + d	e + f	g + h
1+7	0+4	3+6	5+2

Cut and place in **ENVELOPE 2**

② CONCEPTUAL UNDERSTANDING

You've gone camping and have managed to pitch a tent. There is an *order of operations* to pitch the tent. There is no way you can do these steps in a different order. Otherwise the tent won't stand correctly.

Now it is time to go home and you have to pack the tent. Use the images of putting the tent up to help you figure out the *order of operations* necessary to put the tent away.

There are five operations that you need to do. There are five you will not need to use. Put the correct five in order to reveal your next code.

Cut into 11 pieces and put in **ENVELOPE 2**

CONCEPT

	Detach the rain-fly from the top of the tent. **8**	Attach the rain-fly to the top of the tent. **6**
	Remove the pegs from the ground. **2**	Hammer the pegs into the ground. **3**
	Let the tent collapse. **1**	Raise the tent. **7**
	Remove the tent poles from the frame. **9**	Insert the tent poles through the frame. **5**
	Fold up your tarp. **0**	Lay down your tarp. **4**

Cut and place in **ENVELOPE 3**

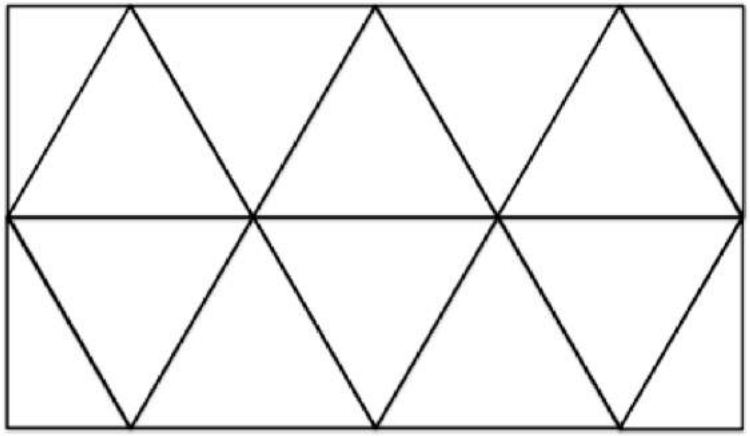
3 SKILL PRACTICE

Arrange the triangles to complete a rectangle. All sides match equivalent sides.

Two sides along the top and two sides along the bottom will not have a match. They create the code.

If you can do this you can learn the year the U.S.'s most famous national park was given this status.

CODE 1 **CODE 2**

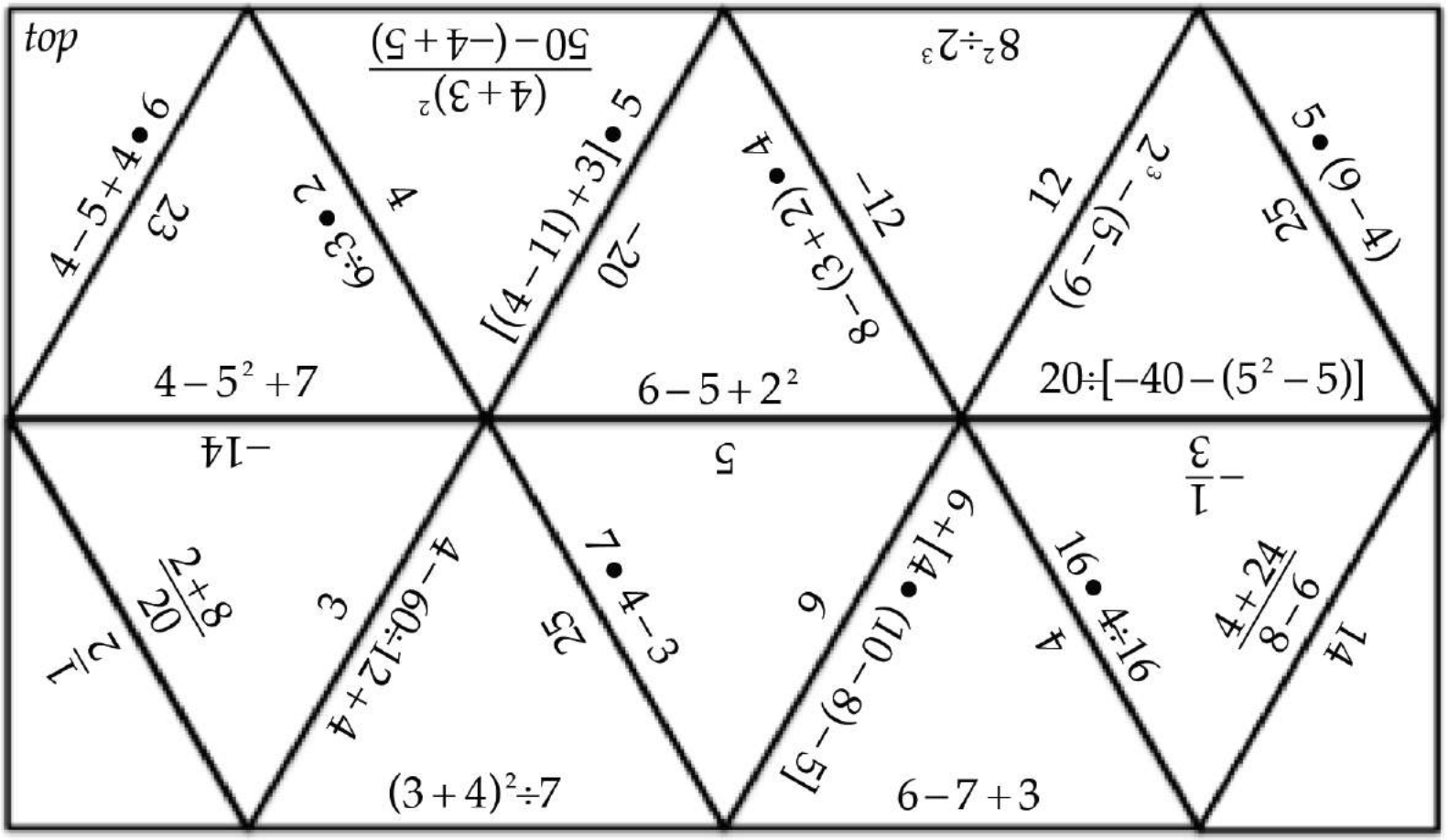


CODE 3 **CODE 4**

ESCAPE MATH

SKILL PRACTICE

Cut into 14 pieces and place in **ENVELOPE 3**



FINAL CHALLENGE

Cut into 4 pieces and place in four different envelopes

ENVELOPE 1

ENVELOPE 4

Simplify to

$$2 \bullet \{6^4 + [\frac{(5-7) \bullet 9}{-1 \div 2} + 49 \bullet 6]\} + 3^5 - 24$$

ENVELOPE 3

ENVELOPE 2

Answer: Final code: 3471 (Yellowstone Square Miles)

Cut and place in **ENVELOPE 4**

4 FINAL CHALLENGE

If you can piece together the final problem and simplify it, you may, just may,

The final code has a special significance. It's the square miles of a favorite park. You might learn a bit about the environment if you can **ESCAPE MATH.**

I HAVE