

Lesson Printables

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Lesson Information Sheet: 2

Sunlight Zone
Activity: 3-4

Twilight Zone
Activity: 5-6

Midnight Zone
Activity: 7-8

Extras
Recording Log: 9
Times Table Toolkit: 10
100s Charts: 11

Let's calculate using the order of operations rules

Why learn this?

Learning the order of operations is essential because it ensures that everyone solves math problems the same way and gets the correct answer. Without these rules, calculations could lead to confusion and inconsistent results. By following the order of operations (PEMDAS), students build a solid foundation for solving more complex equations and applying math accurately in real-world situations.

Solving number sentences using order of operations rules

PEMDAS – The Order of Operations

When solving a number sentence, it's important to follow the order of operations so everyone gets the correct answer. You can remember the order with the acronym PEMDAS, which stands for:

- **P – Parentheses (brackets):** Always solve what's inside parentheses or brackets first.
- **E – Exponents:** Next, work out any powers/exponents.
- **M – Multiplication and D – Division.** (If both appear in a number sentence, calculate starting from left to right.)
- **A – Addition and S – Subtraction:** (If both appear in a number sentence, calculate starting from left to right.)

**Note, this game-based lesson could be used to measure your child's understanding of the four operations and how to apply order of operations rules using PEMDAS. Note, we do not specifically review exponents as they do not apply to the main activity, but you might wish to do so.*

Let's warm up!

Starter Activity - Symbols and Signs

What do the \times and \div symbols mean to students? What words can they connect to each symbol?

To support, students could:

- Be asked guiding questions:
 - What happens when you use these operations on a number?
 - What do you call the answer to a multiplication problem?
 - What do you call the answer to a division question?

To challenge, students could:

- Show what they know already. What are some 'big' multiplication and division problems they already know how to solve?

Let's do this!

Main Activity - Play Castle Capture. Students will flip over 3 cards (or roll dice), to create and solve number sentences using all 3 numbers and the order of operations. Once students have an answer, they should look for it on the game board and circle it. If 3 numbers around the same castle are circled, students can 'claim' the castle. This means it is not longer in play. This activity encourages strategic thinking and problem-solving so that students try to capture 3 castles in as few turns as possible. To make this a two-player game, the rules still apply. Players would take turns flipping over cards or rolling dice and creating number sentences. The aim is to capture more castles than your opponent. In this version, a player can 'bump' another player off their number if a castle has not been claimed.

To support, students could:

- Use the times table toolkit to help them remember multiplication strategies. See printables.
- Play Level One, which involves multiplication, addition and subtraction. See Sunlight Zone.

To challenge, students could:

- Record their number sentences, using brackets when appropriate.
- Play more than one level of the game.
- Change the rules of the game, so they have to claim more than 3 numbers in order to capture a castle.
- Change the rules so that you can use any of the four operations in any way for each number sentence.

Castle Capture Level 1



1. Grab a deck of cards.
2. Get rid of Jacks, Queens and Kings.
3. Flip over 3 cards.
4. Look at your number sentence templates below.
→ You have 4 options. Pick one!
5. Once you've solved your number sentence, look for your answer on the game board.
→ Circle it.
→ If you can't find your answer, flip over new cards.
6. If you circle 3 numbers around the same castle, you can claim the castle.
7. How many turns does it take you to claim 3 castles?

$$\square \times \square + \square$$

$$\square \times \square - \square$$

$$(\square - \square) \times \square$$

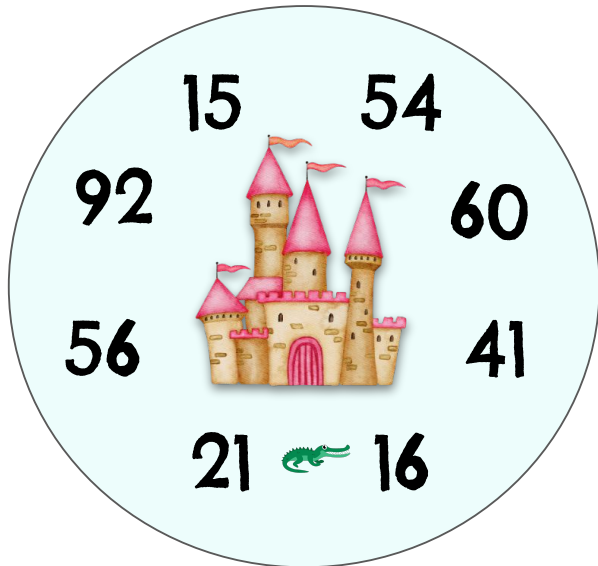
$$(\square + \square) \times \square$$

Challenge: Use order of operations to capture castles.

Excellence: Explore playing more than one level of the game.

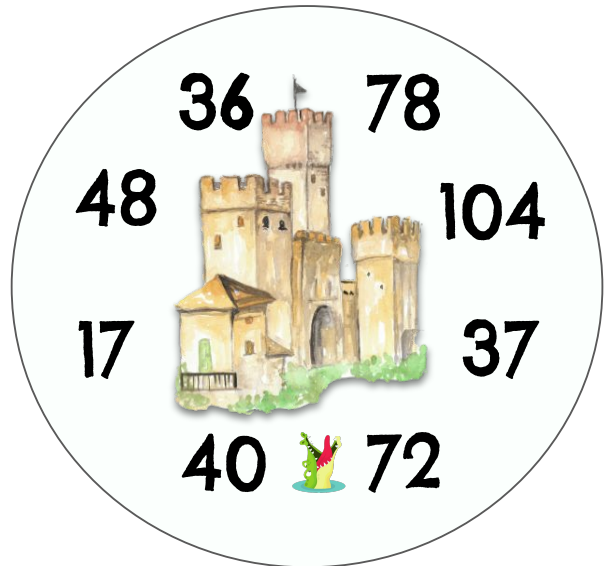
Legend: Play around with your numbers. Can you identify all of your options?

Level 1 Game Board



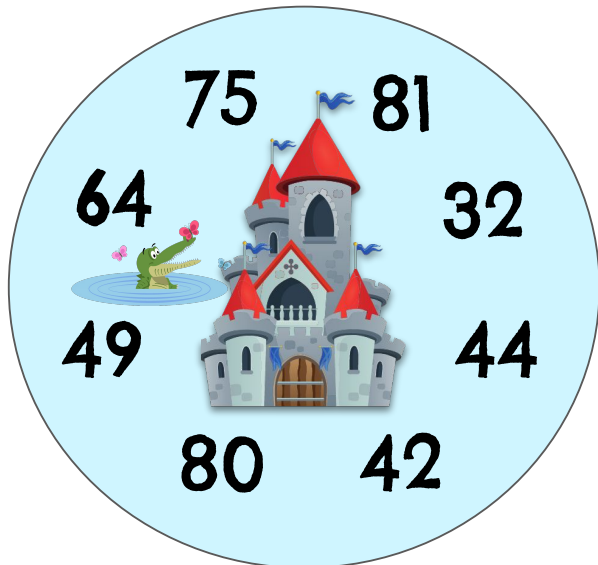
15 54
92 60
56 41
21 16

A light blue circular game board featuring a central illustration of a yellow castle with three pink-roofed towers and a small green crocodile to its left.



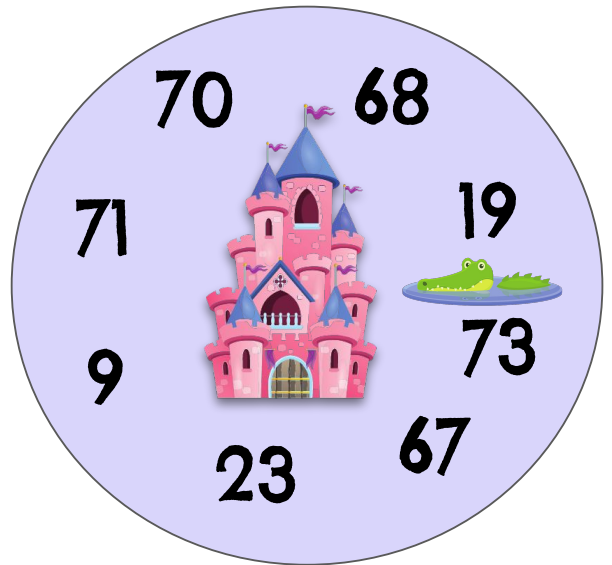
36 78
48 104
17 37
40 72

A light green circular game board featuring a central illustration of a yellow castle with a flag on top and a small green crocodile to its right.



75 81
64 32
49 44
80 42

A light blue circular game board featuring a central illustration of a grey castle with red-roofed towers and a small green crocodile in a pond to its left.



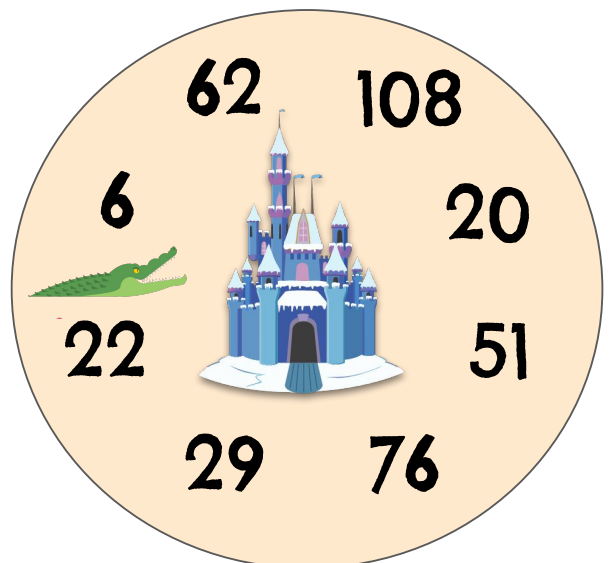
70 68
71 19
9 73
23 67

A light purple circular game board featuring a central illustration of a pink castle with blue-roofed towers and a small green crocodile on a lily pad to its right.



79 11
18 35
27 28
10 24

A light pink circular game board featuring a central illustration of a blue castle with a small green crocodile on a lily pad to its right.



62 108
6 20
22 51
29 76

A light orange circular game board featuring a central illustration of a blue castle with a small green crocodile to its left.

Castle Capture Level 2



1. Grab 3 dice and roll them.
2. You have several options.
 - You must use all 3 dice.
 - You must use multiplication OR division in your number sentence.
 - You can also use addition and subtraction.
3. Look at all of the templates below to help you create a number sentence.
 - Remember, some of the division problems might not work for your numbers.
4. Once you've picked and solved your number sentence, look for your answer on the game board.
 - Circle it.
 - If you can't find your answer, roll again.
5. If you circle 3 numbers around the same castle, you can claim the castle.
6. How many turns does it take you to claim 3 castles?

Multiplication Options

$$\square \times \square + \square$$

$$(\square + \square) \times \square$$

$$\square \times \square - \square$$

$$(\square - \square) \times \square$$

Division Options

$$\square \div \square - \square$$

$$\square \times \square \div \square$$

$$\square \div \square + \square$$

$$\square \div \square \times \square$$

$$\square \div (\square - \square)$$

$$(\square - \square) \div \square$$

$$\square \div (\square + \square)$$

$$(\square + \square) \div \square$$

Level 2 Game Board

27 11
15 42
14 0
8 4

A light blue circular game board featuring a pink castle with three towers and a small green frog on a lily pad in the center.

19 10
6 12
1 17
7 13

A light green circular game board featuring a yellow castle with three towers and a small green frog on a lily pad in the center.

1 6
3 10
33 19
26 34

A light blue circular game board featuring a grey castle with red roofs and a small green frog on a lily pad in the center.

21 16
6 4
9 24
14 12

A light purple circular game board featuring a pink castle with blue roofs and a small green frog on a lily pad in the center.

18 11
20 35
24 28
30 2

A light pink circular game board featuring a blue castle with white roofs and a small green frog on a lily pad in the center.

17 9
6 23
20 41
5 31

A light orange circular game board featuring a blue castle with white roofs and a small green frog on a lily pad in the center.

Castle Capture Level 3



1. Grab a deck of cards.
 - Jacks = 11, Queens = 12 and Kings = 13.
2. Flip over 3 cards. You have several options.
 - You must use all 3 cards.
 - You must use multiplication OR division in your number sentence.
 - You can also use addition and subtraction.
3. Look at all of the templates below to help you create a number sentence.
 - Remember, some of the division problems might not work for your numbers.
4. Once you've picked and solved your number sentence, look for your answer on the game board.
 - Circle it.
 - If you can't find your answer, roll again.
5. If you circle 3 numbers around the same castle, you can claim the castle.
6. How many turns does it take you to claim 3 castles?

Multiplication Options

$$\square \times \square + \square$$

$$(\square + \square) \times \square$$

$$\square \times \square - \square$$

$$(\square - \square) \times \square$$

Division Options

$$\square \div \square - \square$$

$$\square \times \square \div \square$$

$$\square \div \square + \square$$

$$\square \div \square \times \square$$

$$\square \div (\square - \square)$$

$$(\square - \square) \div \square$$

$$\square \div (\square + \square)$$


$$(\square + \square) \div \square$$

Level 3 Game Board

36 7
15 39
49 33
54 🦋 12



2 60
67 31
3 1
37 🦋 53



22 106
76 10
63 13
9 70



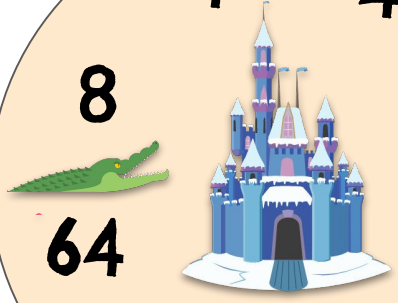
5 3
43 17
72 19
29 23



18 3
110 35
57 85
16 75



4 47
8 0
64 41
116 11



Recording Log

Numbers Sentence	Answer

Times Table Toolkit



Times Table Toolkit



x2	Double the other number.
x3	Multiply the other number by 2 and add 1 more group.
x4	Double the other number and double your answer.
x5	Multiply the other number by 10. Halve the product.
x6	Multiply the other number by 5 and then add 1 more group.
x7	Look at the other number and use its times table strategy.
x8	Multiply the other number by 2, double your answer and double it again.
x9	Multiply the other number by 10 and subtract 1 group from your answer.
x10	Count in 10s.

100s Charts

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100