Lesson Printables

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Lesson Information Sheet: 2

Sunlight Zone
Activity: 3
Optional Place Value Table: 4

Twilight Zone
Activity: 5
Optional Place Value Table: 6

Midnight Zone
Activity: 7
Optional Place Value Table: 8

Let's explore place value

Why learn this?

In order for students to develop a conceptual understanding of numbers, they must understand the value of each digit in a number. Using place value knowledge and visual representations (ones, tens, hundreds, etc.) will show students that numbers are much more than simple digits, as each digit has its own value. Understanding the characteristics of odd and even numbers will help students to further develop their maths skills. When exploring divisibility, students will see that odd numbers can not be divided by 2, unlike even numbers. Knowing this will help students apply particular divisibility rules.
Note, we have used the term 'ones' to indicate the place value column with the smallest value in this lesson. You might wish to use the term 'units' if it is more applicable to your location.

What is place value? How do you identify an odd or even number?

Identifying place value columns
- Place value columns help us identify the value of each digit in a number.
- There are infinite place volume columns. For this lesson, we will work with the first 7 digits (up to millions.)
  - ➔ In this lesson, the ones column has the least significant value and the millions has the most significant value.
    - ◆ 1 one = 1
    - ◆ 1 million = 1,000,000
- Each place value column is 10 times greater than the column to the right. This connection will be useful at a later date when multiplying and dividing numbers by 10, 100, etc.
  - ➔ 1 ten = 10 ones
  - ➔ 1 hundred = 10 tens
  - ➔ 1 thousand = 10 hundreds, etc.

Identifying odd and even numbers
- Identify the digit in the ones place value column.
- Draw 2 circles and then draw the amount of dots that match the digit in the ones column, alternating between circles.
  - ➔ If there is an equal number of dots in both circles, the number is even.
  - ➔ If there isn't an equal number of dots in both circles, the number is odd.

Let's warm up!

Starter Activity - Hidden Question
If the answer is 28, what could the question be? Students are invited to use their number knowledge to come up with a variety of number sentences to match the answer 28. Encourage students to use the 4 operations (+, -, x and ÷).

To support, students could:
- Be prompted to think of ways to make 28 by adding two numbers together or subtracting one number from another.
- Explore counting in 2s, 3s, and 4s, to see if they land on 28. What number sentence could match their thinking?

To challenge, students could:
- Use all four operations to make number sentences that get the answer 28.
- Prove their answers are correct by using inverse operations.
- Try to use more than one operation per number sentence and apply order of operations correctly. (Parenthesis, exponents, multiplication, division, addition, subtraction.)

Let's do this!

Main Activity - Students are given a Bananza challenge sheet. Students should flip over cards to match their learning zone and make a multi-digit number. Does the number match any of the Bananza place value challenges? Students can fill in one number per round. Their aim is to fill in all of the challenges before reaching the end of the deck *(this is not a requirement. It is just an opportunity to add chance and jeopardy into the activity).* Note, this game could be turned into a competitive game if you have two players. The rules are the same. The only difference is the goal is to be the first player to knock off all of the challenges.

To support, students could:
- Work with 5-digit numbers. See Sunlight Zone.
- Use the place value charts found in the printables below to organise their digits.

To challenge, students could:
- Work with 6-digit or 7-digit numbers. See Twilight and Midnight Zone.
- Apply additional number sense. E.g., Identify prime numbers, square numbers, etc. See Midnight Zone.
- Make the game tactical. Once students have flipped over all of their cards, they can move them around to create their own number. E.g., Cards 1, 2, 3 and 5 could be used to make 3,512 so that they can knock off the even Bananaza challenge.

Sunlight Zone

1. Grab a deck of playing cards.
   - ➔ Remove 10s, Jacks, Queens and Kings.
   - ➔ Aces = 1.
2. Flip over 5 cards and make a 5-digit number.
3. Look at the Bananza challenges.
   - ➔ Can you knock off a challenge?
   - ➔ You can only knock off one challenge per turn.
4. Is it possible to knock off all of the Bananza challenges before reaching the end of the deck?

Bananza Challenges (The number must…)	**My Number**	**Proof**
be odd		
be even		
have a tens digit that is even		
have a tens digit that is double the ones digit		
have a hundreds digit that is bigger than the tens digit		
have repeating digits		
have a ones digit that is larger than the ten thousands digit		
have a thousands digit that is smaller than all of the other digits		

Challenge: Match numbers to place value criteria.
Excellence: Explain why your number meets the criteria.
Legend: Make the game tactical. You can move the cards around to make any number you want with the digits that you have.

Place Value Chart

Ten Thousands	Thousands	Hundreds	Tens	Ones

Twilight Zone

1. Grab a deck of playing cards.
   - ➔ Remove 10s, Jacks, Queens and Kings.
   - ➔ Aces = 1.
2. Flip over 6 cards and make a 6-digit number.
3. Look at the Bananza challenges.
   - ➔ Can you knock off a challenge?
   - ➔ You can only knock off one challenge per turn.
4. Is it possible to knock off all of the Bananza challenges before reaching the end of the deck?

Bananaza Challenge (The number must…)	**My Number**	**Proof**
be odd		
be even		
have a tens digit that is double the thousands digit		
have an even number in the hundreds spot		
have an odd number in the tens spot		
have repeating digits		
have a ones digit that is larger than the thousands digit		
have tens and hundreds digits that add up to 6		

Challenge: Match numbers to place value criteria.
Excellence: Explain why your number meets the criteria.
Legend: Make the game tactical. You can move the cards around to make any number you want with the digits that you have.

Place Value Chart

M	H Th	T Th	Th	H	T	O

Midnight Zone

1. Grab a deck of playing cards.
   - ➔ Remove 10s, Jacks, Queens and Kings.
   - ➔ Aces = 1.
2. Flip over 7 cards and make a 7-digit number.
3. Look at the Bananza challenges.
   - ➔ Can you knock off a challenge?
   - ➔ You can only knock off one challenge per turn.
4. Is it possible to knock off all of the Bananza challenges before reaching the end of the deck?

Bananaza Challenge (The number must…)	**My Number**	**Proof**
be odd		
be even		
have a tens digit that is double the millions digit		
have an even number in the thousands spot and an odd number in the hundred thousands spot		
have a prime number in the tens spot		
have a square number in the ten thousands place value column		
have digits in the ten thousands and tens that add up to 8		
have a ones digit that is smaller than all of the other digits		

Challenge: Match numbers to place value criteria.
Excellence: Explain why your number meets the criteria.
Legend: Make the game tactical. You can move the cards around to make any number you want with the digits that you have.

Place Value Chart

M	H Th	T Th	Th	H	T	O