**Bringing Learning Alive!**

Bringing Math Alive Units

**Grade 7 – Integers Unit**

This comprehensive unit Includes:

* **14** lessons to cover listed outcomes

Each lesson includes:

* + Detailed lesson plans
	+ Choice of interactive math strategies/ games
	+ Choice of differentiated worksheets & tasks
* Unit Assessments
* Unit Concept Based-Projects

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Bringing Math

Alive!

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# 1. Introduction

Are you tired of teaching from the textbook? Do you want to get re-energized and learn how to get your students excited about Math? Bringing Math Alive will provide you with hands on activities to use in Math. It is an excellent supplementary resource to use in your classroom. Bringing Math Alive provides the classroom teacher with lesson plans, 2-3 games and choice tasks per lesson.

You will be sure to meet the needs of all students. The resource also includes assessments through concept-based learning tasks, projects and pencil/ paper activities. This resource is sure to cover all of your curricular outcomes and it’s simple and easy to use. Got a sub? No problem! We got you covered. Print off the lesson packages and your planning is done.

We set the program up for teachers. We made it easy to use, student centred and exactly how teachers want resources laid out. No flipping back and forth between lessons, materials, and BLMs. The resources is laid out in lessons groups with everything you need. It truly shows teachers how to Bring Math Alive!

# 2. Basics of Differentiated Instruction

We all know that every classroom has many different types of learners. Differentiated Instruction focuses on the same ideas and objectives. It is the instructional path and/or process that changes. Teachers instruct to meet the needs of individual students. Some of the ways that this is done includes:

* Perceive learning environment.
* Incorporate a variety of materials, experiences and assessment tools.
* Contains variables that can be changed within the context of a lesson, unit or project.

# 3. Classroom Set-Up

Playing games is a great way to actively engage your students in Math! Initially you will need to model and teach the students how to play the games. You will also have to set clear expectations when playing games.

For example, you might want to tell a grade 6 class not to use the dice as rocket launchers and you might have to tell the grade 1 class not to eat the dice. You will then introduce the concept of the games through a mini lesson and through examples. You will then need to model the game (do this lots when you are first starting out) perhaps begin playing as a class.

Allow students enough time to play the game. Once they have completed the game they can choose an A, B, C, or D levelled tasks. A being a basic, guided level and D being independent, learning level. Students are usually very good at choosing an appropriate level. If needed, select appropriate activities for individuals or for the entire class. This process eventually runs itself.

# 4. Methods to Math Madness!

Here’s a quick overview on how to run a typical lesson:

#

**Introduction:**

1. Math Journal/ Mini-Lessons
* Go through concepts in the form of a mini-lesson. Vary the topic of the lesson according to grade and level.
* Lower Grades – Do examples on the board of the concept in the game.
* Higher Grades- Have the students copy notes into a math journal/ notebook and provide examples. Have students refer back to this if having problems playing the game.

***How to modify:***

* Provide cloze notes
* Provide notes as handouts

# Activities:

1. Mover and Shakers
* Have students copy out the game board and thinker questions or hand out game boards.
	+ Model how to play the game to the large group. Either show an example or play first as a large group. Ensure for majority understanding before splitting off.
	+ Play as a class, small group or in partners.
	+ Allow students to pick partners/ groups or assign (think about individual student ability).
	+ Allow students time to play the game.
	+ Once they have finished, have student bring up their boards to you or an assistant. Check over one or two questions/ thinkers. Be sure students have completed all expectations of the game.
	+ Re-teach if necessary.

***How to modify:***

* Provide game boards to students.
* Change game boards for ability.
* Teacher selects pairings or groups.
* Teacher plays with a group.
* Change “Thinker” questions.

# Closure:

1. Worksheets/ Tasks – Reinforce the Concept
* Pick out a ready made worksheet that reinforces the concepts from the game
* Mark together to evaluate.
* Have students do corrections on separate paper.
* Check corrections.

***How to modify:***

* Modify the task
* Reduce question number

#

# Evaluation:

* Mark the game boards
* Mark the “Thinker” questions
* Mark the worksheets
* Mark the corrections

# Timing

* One full lesson takes a double block (2 x 45 minutes).
* However, some lessons may take 2 days to complete when concepts are first being introduced rather than being built upon.
* If possible, if you are re-teaching, do a game and a worksheet in one period.

# 5. Tools of the Trade

**Whiteboards** – Small, individual whiteboards or chalkboards. Preferably one per student. Have students bring in “mini gloves” to use as erasers.

**Smelly Felts** – Thick felt pens that smell yummy

**Gel Pens** – Pens that write in cool colours

**Dice** – Various types of dice (for example, 6-sided, 10-sided, 12-sided, etc)

**Cards**- Mini decks, jumbo decks or regular decks.

**Grade appropriate manipulatives** – varies per grade (for example, cube-links, base-10 blocks, geometric solids, money, miras, geoboards, moveable clocks, etc.)

**Crazy Scissors** – These are scissors that have fancy cut patterns as students use them.

# 6. Our Lingo

A quick overview of some of the terms that you may encounter while going through the lessons:

**Mover & Shakers** – A hands-on activity. A game that gets your students moving!

**Thinkers** – Questions that requires students to reflect on the processes learned throughout an activity.

**Junk Its** – When students are playing a game, a “Junk-It’ is when a player is able to discard the number and not include it during play. This encourages students to think of the strategies. (Thanks Tyler for coining this term!)

**Math Journal** – A separate scribbler where students reflect on the learning for the lesson and write down processes and examples of the skills learned.

**7. Concept Based Learning**

All of our Concept Based Learning tasks are built throughout the lessons. You will find if you progress throughout the graded units, activities are re-visited, building on the previous grade. We also included more directed projects at the end of each unit.

# 8. Bringing Math Alive! Resources (Available for Grades 1-7)

**There are 6 books or strands that cover the curriculum**;

* Number Concepts
* Number Operations
* Patterns (And Relations)
* Measurement
* 2D and 3D shapes
* Statistics (Grade 2-4) and Probability (Grade 5-7)
* Grade 6 also includes: Fractions, Decimal, Ratio and Percent (7 units)
* Grade 7 also includes: Fractions, Decimal, Ratio and Percent and Integers (8 units)

Concept Based Learning is integrated into each lesson.

Each book includes:

**Lesson plan:** - outcome

* introduction
* activity
* closure

**Movers & Shakers:** - 2-3 math games to choose from

**Worksheets:** - 4 differentiated worksheets for your students to choose from to meet the needs of all the different levels of students in the classroom.

**Concept Based Projects:**

* Projects & Learning tasks to carry throughout the unit. You can use as enrichment or as an assessment.

**Assessment:** - 2 levelled assessments, 1 very guided and the other one is student guided, where they choose their own numbers to put into the questions.

**9. Learner Outcomes Grade 7**

**Number**

* Demonstrate an understanding of addition and subtraction of integers, concretely, pictorially and symbolically.

**Achievement Indicators**

* Explain, using concrete materials such as integer tiles and diagrams, that the sum of opposite integers is zero.
* Illustrate, using a number line, the results of adding or subtracting negative and positive integers; e.g., a move in one direction followed by an equivalent move in the opposite direction results in no net change in position.
* Add two given integers, using concrete materials or pictorial representations, and record the process symbolically.
* Subtract two given integers, using concrete materials or pictorial representations, and record the process symbolically.
* Solve a given problem involving the addition and subtraction of integers.

**10. Math Word Wall Suggestions**

These words occur throughout the unit. Use them on your Math Word Wall and come up with the definition as a class.

Zero pair

Zero principal

Integers

Positive integer

Negative integer

Opposite Integer

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Word Wall BINGO**

Listen for these key words during MATH class. Whenever you hear one of the words said during a whole class discussion, call out the same word. You must be able to give a definition and an example. I will stamp it off on your card. Once you have all of the words stamped…you will win!

|  |  |  |
| --- | --- | --- |
| Zero Pair | Zero Principle | Positive Integer |
| Negative Integer | Integer | Number Line |
| Opposite Integer | Sum | Difference |

Rules:

1. Words can only be stamped off in MATH CLASS!
2. I will only stamp off 3 different words per class.
3. If a word has already been stamped off, it is dead until next class.
4. You will need to define and provide an example of the word before you can have it stamped off.

Materials:

- Sticky Notes

- Whiteboards & Markers

- Cards (A-9)

- 6-sided die, 10-sided die

**Lesson 1 – Introduction to Integers**

*Objectives:*

* Students will explore the meaning of positive and negative numbers.

**Introduction**

1. Play a sorting game with the students. Handout out Integers BLM to the students. Have the students cut out the numbers and sort the numbers on their desks. Ask the students to explain their sorting rule.
2. On the board create a t-chart.

Positive Numbers Negative Numbers

Handout 2 sticky notes for each student. Have the students write down something that they know about a positive number on their sticky note and on the other something they know about a negative number. Have the students share their knowledge as they place them on the appropriate sides of the t-chart.

1. Place math journal notes on the overhead and have students copy. Discuss points as you go through. For modified students, handout the notes. Have the students fill in only the solutions as you discuss with the class.

**Activities**

1. Play: I Owe the Bank. Discuss with students the meaning of owing money and making money. When you owe money, you are considered in the minus. When you make money, you are in the plus. Handout whiteboards and makers to the students. Write on the board: I owe $5.00 or -5 vs. I made $3.00 or (+3). Which is the greater amount of money? Why? Which is the least amount of money? Why? Do a few more examples. Then move onto: Which is more, +40 or -5? -40, or -50? Etc. Students will the greater value onto their whiteboards. Then continue with the reverse.
2. Choose a Mover and Shaker activity.

 a) Number Battles – Place students into pairs. Each pair needs a deck of cards (A-9). Pairs must split the cards equally. Assign red cards as negative numbers and black cards as positive number. Have the students each flip over one card. Record numbers in the appropriate columns. Place the appropriate sign in the box. The player who has the larger number will score one point.

* 1. Integer Number – Place students into pairs or groups. Each player will roll the 10-sided die 3 times and arrange the cards to form a 3 digit numbers. Roll a 6-sided die. If the number rolled is even, your number becomes positive and if the number appearing odd, then your number becomes negative. Place the number in the appropriate column on your game board. Compare your numbers and place in the correct sign to complete the number sentence. The play who has the larger number will score one point.
1. Choose worksheets for your students to complete to reinforce the previous activities. Either allow students to select a worksheet appropriate for their level, or the teacher may choose sheets suitable for an individual or the entire class.

**Closure**

1. Have students take out their math journals and write down how we use integers in everyday life. Then have students show the meaning of a positive integer and negative integers and how to determine which integer is greater.

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lesson 1 – Introduction to Integers

Integer BLM

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| -32 | 32 | -45 | +45 | 70 |
| -90 | -43 | +33 | +21 | -20 |
| -96 | +50 | 54 | -12 | 13 |
| -99 | +11 | 10 | 14 | +26 |
| 77 | 88 | -10 | +32 | 55 |

Lesson 1 – Introduction to Integers

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Math Journal Notes

Words to Know

Integer – any counting number, both positive and negative.

Eg. +1, +2, +3…etc. or 1, 2, 3…etc, or -1, -2, -3, …etc

Opposite Integers – Two integers with the same numeral, but different signs. Two integers represented by points that are the same distance in opposite directions from zero on a number line.

Eg. +3 and -3

-3 0 +3

Which number is greater?

When a number is positive, it may have a + sign in front of it. If the number does not have any sign, then assume it is positive.

A positive number increase with increasing place value and digits.

For example, +435 is greater than 433.

A negative number decreases as the numerals create a larger number.

For example, -435 is less than -33.

Try…

Which is greater? Why?

45 or -12 -44 or -33 +44 or 55 -32 or -100

Lesson 1 – Introduction to Integers

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Number Battles

Mover & Shaker (a)

Get into pairs. Each pair needs a deck of cards (A-9). Pairs must split the cards equally. Assign red cards as negative numbers and black cards as positive number. Have the students each flip over one card. Record numbers in the appropriate columns. Place the appropriate sign in the box (<, >, or =). The player who has the larger number will score one point.

|  |  |  |  |
| --- | --- | --- | --- |
| My Number | Sign | Partner’s Number | Points |
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Thinkers:

How do can you tell which integers is greater? Explain.

Lesson 1 – Introduction to Integers

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Integer Numbers

Mover & Shaker (b)

Get into pairs or groups. Each player will roll the 10-sided die 3 times and arrange the cards to form a 3 digit numbers. Roll a 6-sided die. If the number rolled is even, your number becomes positive and if the number appearing odd, then your number becomes negative. Place the number in the appropriate column on your game board. Compare your numbers and place in the correct sign to complete the number sentence. The play who has the larger number will score one point.

|  |  |  |  |
| --- | --- | --- | --- |
| My Number | Sign | Partner’s Number | Points |
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Thinkers:

How do can you tell which integer is greater? Explain.

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lesson 1 – Introduction to Integers

Worksheet A

1. Write the opposite integer.

a) -3 b) +4 c) -55

d) -32 e) 56 f) +30

g) 14 h) -99 i) 102

1. If one red disc represents a negative number and one black disc represents a positive number, then draw each of the following integers.

a) 12 b) -6 c) +7

1. Circle the integer that is greater.

a) -32 or 12 b) 16 or +12 c) -99 or -14

Lesson 1 – Introduction to Integers

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Worksheet B

1. Write the opposite integer.

a) -4 b) +12 c) -5

d) -22 e) 32 f) +26

g) 34 h) -11 i) 78

1. If one red disc represents a negative number and one black disc represents a positive number, then draw each of the following integers.

a) 8 b) -5 c) +12

1. Circle the integer that is greater.

a) -67 or 62 b) 19 or +80 c) -104 or -4

Lesson 1 – Introduction to Integers

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Worksheet C

1. What are opposite integers? Give an example.
2. What is a positive integer? Give an example.

3. What is a negative integer? Give an example.

1. Why is any positive integer greater than any negative number? Explain.

5. Show how you can compare two negative integer numbers.

Lesson 1 – Introduction to Integers

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Worksheet D

1. Give 4 examples of opposite integers.

a) b)

1. d)

2. If one red disc represents a negative number and one black disc represents a positive number, then draw an example of 2 positive integers.

a) b)

3. Draw 2 examples of negative integers.

a) b)

1. Show a number sentence that compares:

a) A positive and a negative integer

b) 2 positive integers

c) 2 negative integers