

1. Numbers & Operations

Place Value Gr. 8
N-1

Materials: Ghetto Blaster
Cassette "NUMBERS"
Student recording cassette
Answer sheet

On your answer sheet write the following as numbers:

1. Whole numbers:

- a) nine hundred eighty seven
- b) one million three
- c) forty thousand three hundred seventy
- d) two hundred nine million, one hundred thousand
- e) one billion
- f) fifty-six million, three hundred forty thousand, four hundred seven

2. Decimal numbers

- a) two hundredths
- b) $\frac{56}{10\,000}$
- c) five hundred and five thousandths
- d) one billion, three hundred thousand and six tenths
- e) seventy eight and nine hundred forty three thousandths
- f) seven ten thousandths

3. Find the Ghetto Blaster and the cassette labelled "NUMBERS". Rewind if necessary. Listen to the cassette as you write the numbers on the answer sheet. BE KIND AND REWIND!

4. Place the student recording cassette in the ghetto blaster. Find the spot where the last student ended his or her recording. You will need to record your name and then read the numbers on the other side of this card. Read clearly and slowly. After you are finished number 10 say "finished" slowly. DO NOT REWIND!

When you have completed this station,
place your answer sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

2. Numbers & Operations

Place Value Gr. 8
N-1, N-59, R-1F

Materials: blank cheques
recycled envelope

1. Carl saved his money and bought a mountain bike. His grandmother had given him \$179.49 which is half the cost of the bike. Carl wrote a cheque for the full amount. Show how he wrote the amount in words and in numbers on the blank cheque.
2. Carl's step mother purchased a new refrigerator. With the tax it cost \$1834.86. She paid in three payments (January, February and March). Write the January cheque and the two post dated checks she made to the store.
3. Carl's father had a garage sale. Carl helped him with the pricing of the items. His father said to sell the comics at 20 for \$1.00. Carl wrote \$.05 on each comic. Is this correct? Explain.
4. His dad sold his lawn mower at the same garage sale. He was asking \$30.00 but his neighbor talked him into taking 30% off. Write the cheque that the neighbor wrote for the mower.
5. Carl's sister lives with a friend. They share the cost of rent and utilities, but they pay their own phone and food. The expenses for June added up to \$942.23 Her friend paid her share which was \$592.09. Write your sister's cheque for her share of the expenses.
6. Carl's grandfather decided to help Carl pay for his bike. He gave Carl 50% of the amount he had to pay. Write the cheque Carl's grandfather wrote to Carl.

When you have completed this station,
place your cheques in a recycled envelope
and put the envelope in your portfolio

Do not forget to label your entry.
Please tidy up the station.

3. Numbers & Operations

Place Value 8
N-1, N-4, N-5
Real-World Applications

Materials: Internet
atlases
encyclopedia
reference materials on SPACE

- 1. Look through the materials that are provided or do some research in your library to find:**
 - a) 10 situations in which large whole numbers are used with reference to SPACE.**
 - b) 5 situations to do with SPACE where decimal numbers can be used.**
- 2. Write the numbers you have found and write a few sentences to explain the context in which they were used.**
- 3. List (vertically) each set of numbers that you found from the least to the greatest. Explain your strategy.**
- 4. Round each number from the list of large whole numbers to the nearest thousand.**
- 5. Round each number from the list of decimal numbers to the nearest tenth and to the nearest hundredth.**

When you have completed this station,
place your answer sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

4. Numbers & Operations

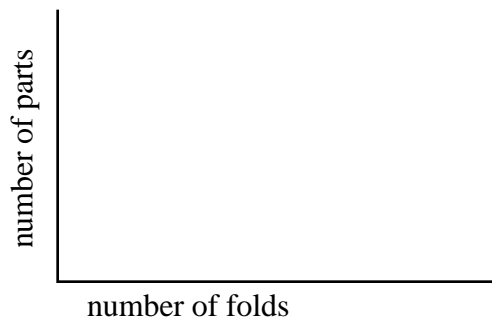
Place Value Gr. 8
N-11

Materials: calculator
paper (preferably 11 x 17)

1. **Make a chart as the one below on a sheet of paper.**
2. **Fold a sheet of paper in half and record the number of parts the sheet has been divided into.**

number of folds	number of parts	parts as powers of 2

3. **Then fold the paper in half again and record the number of folds and the number of parts.**
4. **Continue folding in half and recording the number of folds and the number of parts.**
5. **What is the maximum number of folds possible?**
6. **If you were able to fold the paper 12 times, how many parts would there be?**
7. **What is the relationship between the number of folds and the number of parts the paper is divided into?**
8. **Make a graph of your results:**



9. **In this case, do you join the points on the graph? Explain your answer.**

When you have completed this station,
place your answer sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

5. Numbers & Operations

Place Value Gr. 8
N-6, N-30
P-1, P-2, P-6

Materials: calculator
blocks

In February of a leap year, you and your sister were discussing your allowances.

She says: I wish I would receive \$1.00 February 1st, \$2.00 February 2nd, \$3.00 February 3rd and so on until the last day of the month.

**You disagree and tell her you have a better plan:
You wish you would receive one penny the first day, 2 pennies the second day, 4 pennies the third day and 16 pennies the fourth day until the last day of the month.**

She laughs at you and asks why you would only want pennies per day when she is asking for dollars.

- a) **Calculate to see who would receive the most money? Explain your strategy.**
- b) **Explain the relationship in each case.**

When you have completed this station,
place your answer sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

6. Numbers & Operations

Place Value Gr. 8
N-6

Materials: tiles
linking cubes
ready built models of linking cubes

1. Use the tiles to build the following:
 - a) the product of 6×6
 - b) four squared
 - c) 5^2

2. Use the grid paper to record your constructions.

3.
 - a) In your own words, explain what it means to “square” a number.
 - b) In the expression 3^2 the 3 is called the _____ and the 2 is called the _____.
It means _____.

4. Use the cubes to build the following:
 - a) the product of $4 \times 4 \times 4$
 - b) three cubed
 - c) 2^3

3. Use a sketch to record your constructions.

4.
 - a) In your own words, explain what it means to “cube” a number.
 - b) In the expression 4^3 the 4 is called the _____ and the 3 is called the _____.
It means _____.

When you have completed this station,
place your sketches in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

7. Numbers & Operations

Place Value Gr. 8
N-6, N-82

Materials: calculator
computer spreadsheet (optional)

1. a) Use the calculator to calculate the powers of 3. Use the constant (repeated multiplication) key repetitively on your calculator (the = key) or a spreadsheet on your computer. Record as a chart:

3^1	3^2	3^3	3^4	3^5	3^6	3^7	3^8	3^9	3^{10}

- b) Describe the pattern.
- c) How could you predict the units digit of 3^{50} ?
2. a) Repeat using chart for numbers 2 to 10 as base and check the pattern in each case.
- b) Also, in each case, predict the units digit of power of 50 for that number.

When you have completed this station,
place your answer sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

8. Numbers & Operations

Place Value Gr. 8
N-7

Materials: number tents
hanger or sticks
dice
laminated cards with expanded numbers

1. Use the number tents to record the numbers as expanded numerals using powers of ten and as expanded numerals using exponential notation. Record on a sheet of looseleaf.

number	expanded form	exponential notation
3256	$3 \times 1000 + 2 \times 100 + 5 \times 10 + 6 \times 1$	$3 \times 10^3 + 2 \times 10^2 + 5 \times 10^1 + 6 \times 10^0$

2. Write the following numbers in expanded form using powers of ten:

- | | |
|----------------|------------------|
| a) 56 280 | b) 100 001 |
| c) 142 895 253 | d) 4 000 000 000 |
| e) 7 000 000 | f) 3000 |
| g) 800 | h) 20 |
| i) 6 | j) 427 388 |

3. a) Pick laminated card labelled "A". Roll the dice. Use the erasable marker to write the sum of the number you rolled in the first box. Roll again for the second box, etc. Continue until all boxes are filled and record the number you have created on your answer sheet.
- b) Repeat one more time using the same card. Find the difference between your two numbers. Record.
- c) Repeat using card "B". Find the difference between this new number and the two first numbers you generated. Record.

When you have completed this station,
place your answer sheet in your portfolio.
Do not forget to label your entry.

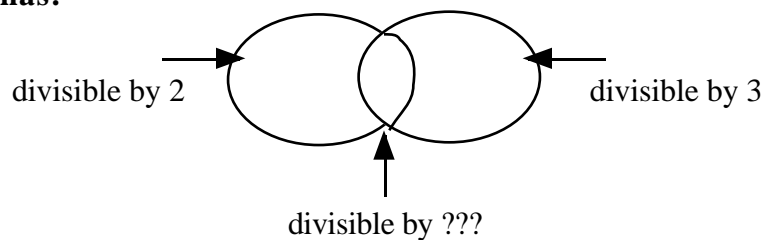
Please tidy up the station.

9. Numbers & Operations

Place Value Gr. 8
N-26

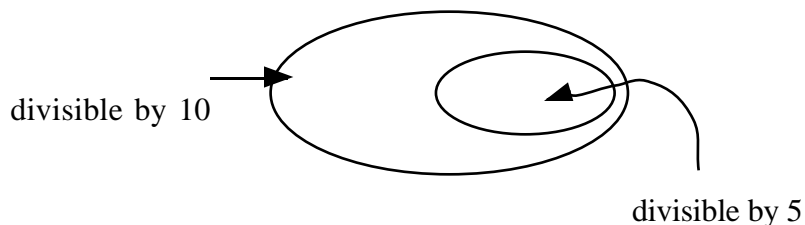
Materials: activity mats (Venn diagrams)
recording sheet
calculator
number cards (color coded)

1. Find the yellow number cards and the mat that has:



Place each card in the correct section. Those numbers which belong in the intersection of the two ovals are divisible by 2 and they are also divisible by 3. This means that they are also divisible by ? .
Record the numbers on the answer sheet.

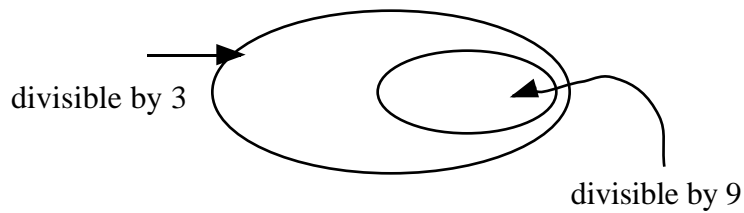
2. Find the blue number cards and the mat that has:



Place each card in the correct section. Explain why the mat is shaped like this one rather than like the one you used in 1.
Record your numbers on the answer sheet.

Please turn the card over . . .

3. Find the pink number cards and the mat that has:



Place each card in the correct section.

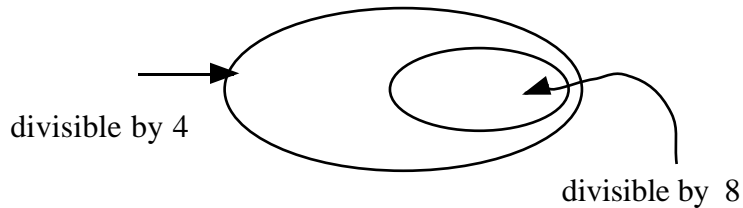
Are all numbers divisible by 3 also divisible by 9?

Are all numbers divisible by 9 also divisible by 3?

Explain.

Record your numbers on the answer sheet.

4. Find the green number cards and the mat that has:



Place each card in the correct section.

Explain why numbers divisible by eight are also divisible by 4. Is the reverse true? Why or why not?

Record your numbers on the answer sheet.

5. State the divisibility rules to determine whether a number is divisible by each of the following:

2 4 8 5 10 6 3 9

When you have completed this station,
place your answer sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

10. Numbers & Operations

Place Value Gr. 8
N-26

Materials: base ten blocks

1. There are nine players on a baseball team. If 365 people showed up for a tournament, and teams were made up, would there be anyone left over? **DO NOT DIVIDE!** Use the divisibility rule to explain your answer.
2. A bag of marbles can be divided into equal parts among 2, 3, 4, 5, or 6 friends (with none left over). What is the smallest number of marbles the bag can contain? Explain your strategy.
3. Make up two word problems which involve divisibility rules and answer them.

When you have completed this station,
place your answer sheet in your portfolio.
Do not forget to label your entry.

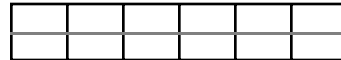
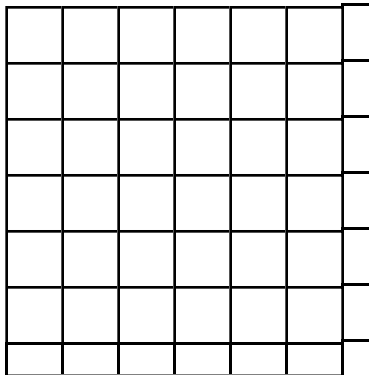
Please tidy up the station

11. Numbers & Operations

Place Value Gr. 8
N-28, N-29b

Materials: grid paper
calculator
scissors
glue

Hannah used square tiles and grid paper to show that the square root of 42 is not a whole number. She made the largest square possible, using 36 of the 42 tiles, and traced a 6x6 square on grid paper. She then cut a strip of six squares to represent the six leftover tiles. She cut it and placed it on the grid as shown below:



1. Estimate $\sqrt{42}$ from the diagram.
2. Compare your estimate with a calculator result.
Write the sequence of keys that you used to find the answer on your calculator.
3. Use grid paper, scissors and glue to demonstrate Hannah's method for estimating the square roots of 56 and 130. Explain your solution.

When you have completed this station,
place your answer sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station

12. Numbers & Operations

**Place Value Gr. 8
Exponents N-30**

Materials: base ten blocks
centicubes or linking unit cubes (base ten)

- 1. Use the base ten blocks to represent to first four powers of ten (from 10^0 to 10^3). To record draw and label sketches of your models.**
- 2. What would the first four powers of 2 look like? Use centicubes to built 3-D models of these. Sketch the shape and size. Label the dimensions and write the total number of cubes in each.**
- 3. Use your models to explain the shape and size of the fifth and sixth powers of 2. Sketch the shape and size. Label the dimensions and write the total number of cubes in each.**
- 4. How will models representing the powers of three be like the models you sketched? How will they be different?**
- 5. What is greater, 2^5 , or 5^2 ? Explain.**

When you have completed this station,
place your answer sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

13. Numbers & Operations

Integers Gr. 8
N-32, N-34

Materials: books on sports statistics
Guinness Book of records
newspapers
sports magazines

1. **Find at least three different sports in which integers are used. Explain how integers are used in each sport.**

When you have completed this station,
place your work in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

14. Numbers & Operations

Integers Gr. 8
N-32, N-34

Materials: books on sports statistics
Guinness Book of records
newspapers
sports magazines
resource person

1. Choose one of the following sports.

hockey tennis golf

2. Research (either by reading about or by interviewing someone in your community) to explain the basic rules of the game.
3. Explain how integers are used in that sport.
4. Find some statistics or create some scenarios which will help you develop an activity sheet about integers and the sport you have studied.

When you have completed this station,
place your work in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

15. Numbers & Operations

Integers Gr. 8
N-34

Materials: old magazines
references etc.
magazines
various objects

Brainstorm 6 uses of integers in the real world. Find a real world example of each to explain your work. (For example you can cut stock market reports and sports standings from the newspaper or from magazines. You may even use real objects! Display your work in three dimensions. More marks are given for creativity!

When you have completed this station,
post your 3-d model in the classroom.
Do not forget to label your entry.

Please tidy up the station.

16. Numbers & Operations

Integers Gr. 8
N-32. N-37

Materials: red die and green die
(or any two different colors)

1. **Play a game. Toss a red die and a green die together. For each toss, the red die shows how many points you win and the green die shows how many points you lose. Represent the points you win with red chips and the points you lose with green chips. If each point lost (green chip) can cancel a point (red chip), show how you can find your score for each toss.**
2. **For each toss, how many ways can you get a score of zero (0)?**

When you have completed this station,
place your answer sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station

17. Numbers & Operations

Integers Gr. 8
N-36

Materials: Deck of cards
(no face cards and aces = 1)

1.
 - a. Shuffle the cards and place the pile in front of you.
 - b. Black cards are positive and red cards are negative.
 - c. Flip two cards over and record them on the activity sheet as integers.
Circle the one that is greater than the other.

Ex: -6 and $\textcircled{-3}$

Repeat 10 times.

2.
 - a. Shuffle the cards and place the pile in front of you. Remember that black cards are positive and red cards are negative.
 - b. Flip five cards, place them in ascending (least to greatest) in front of you. Record them as integers.
 - c. Repeat five times.
3. Complete the activity sheet.

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

18. Numbers & Operations

Integers Gr. 8
N-33, N-37

Materials: checkers
colored bingo chips
+ and - tiles

1. Choose one of the manipulatives provided at this station to demonstrate each of the following additions. Use diagrams to explain your work.

$$(+3) + (+5)$$

$$(+3) + (-5)$$

$$(-3) + (+5)$$

$$(-3) + (-5)$$

2. How can you use a thermometer to explain $(-23) + (-3)$?
3. How can you use a cassette tape to explain $(+523) + (-325)$?
4. How can you use an elevator panel to explain $(+2) + (+8)$?
- 5) How can you use electron charges to explain $(-9) + (+4)$?
6. How can use use money to explain $(-4) + (+4)$?

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

19. Numbers & Operations

Integers Gr. 8
N-35, N-37

Materials: activity sheet (number lines)
colored bingo chips or two colors of cubes

1. Use small squares or circles to represent integers. State which color you are using to represent positive numbers and which color you are using to represent negative numbers.

Draw 5 different addition statements for positive and negative numbers and answer them. Under each drawing write the statement using numbers and the signs for positive and negative numbers.

2. Addition can also be illustrated on the number line. Draw a number line for each of the following and explain the addition in each case:

a) $(+7) + (+10)$

b) $(-15) + (-13)$

c) $(-3) + (+2)$

d) $(+5) + (-4)$

e) $(+6) + (-6)$

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

20. Numbers & Operations

Integers Gr. 8
N-37

Materials: two-sided counters

RED + positive
YELLOW - negative

1. Place the two sided counters in a bag or in a container.

2. Take a handful and “drop” them on the table.
Record as an addition statement and calculate.
e.g.

$$3 \text{ reds} + 5 \text{ yellows} = +3 + -5 = -2$$

3. Repeat 12 times.

4. Use the counters to help you calculate:

- a) The sum of two integers is +7.
One integer is -10, what is the other integer?
Write the addition statement.
- b) The sum of two integers is -5.
One integer is -3, what is the other integer?
Write the addition statement.
- c) The sum of two integers is -3.
One integer is -3, explain how the other number is
neither positive nor negative?
Write the addition statement.
- d) The sum of two integers is 0.
One integer is -8, what is the other integer?
Write the addition statement.
- e) The sum of two integers is -4.
One integer is 8, explain why the other integer
must be negative.

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

21. Numbers & Operations

Integers Gr. 8
N-34, 37

Materials: colored bingo chips
+ and - tiles

1. Use two colored chips or cubes to create 3 ways to represent zero (0) knowing the two colors cancel each other.
2. Write 3 real life situations to show a gain or a loss of zero (0).
3. Use two colored chips or cubes to create 3 ways to represent a gain of +3 knowing the two colors cancel each other.
4. Write 3 real life situations to show a gain of + 6.
5. Use two colored chips or cubes to create 3 ways to represent a loss of -6 knowing the two colors cancel each other.
6. Write 3 real life situations to show a loss of -10.
7. In your own words define the word “integer”.

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

22. Numbers & Operations

Integers Gr. 8
N-37

Materials: checkers
colored bingo chips
+ and - tiles

1. Choose one of the manipulatives provided at this station to demonstrate each of the following subtractions. Use diagrams to explain your work.

$$(+2) - (+7)$$

$$(+2) - (-7)$$

$$(-2) - (+7)$$

$$(-2) - (-7)$$

2. How do you use a thermometer to explain a drop of 5 degrees? Draw 3 subtraction statements that show this drop in temperature.
3. Sometimes when you go in a roller coaster you feel “queasy” when there is a quick drop in elevation. Explain a drop in elevation of 40 metres. Draw three subtraction statements that show this drop in elevation.
4. Losing money can also be used to explain subtraction of integers. Write three subtraction statements to show a loss of more than \$1000.00.
5. Use any of the above real life situations or make up your own to show three different cases where there was no loss and no gain.

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

23. Numbers & Operations

Integers Gr. 8
N-37

Materials: Two colored counters
RED + positive
YELLOW - negative

Use small squares or circles to represent integers. Using two different colors, state which color you are using to represent positive numbers and which color you are using to represent negative numbers.

1. Take 5 red counters away from 10 red counters.
Explain your strategy.
2. Take 3 yellow counters away from 7 yellow counters.
Explain your strategy.
3. Take 4 yellow counters away from 4 yellow counters.
Explain your strategy. Would you get the same results if you took away 4 red counters from 4 red counters?
4. Take 2 yellow counters away from 3 red counters.
Explain your strategy.
(Remember that these are many ways to represent 2 yellow counters because red counters and yellow counters cancel themselves or equal to “0”).
5. Take 6 red counters away from 2 yellow counters.
Explain your strategy.

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

24. Numbers & Operations

Integers Gr. 8
N-37

Materials: activity sheet with number lines

1. Subtraction can also be illustrated on the number line. Use the activity sheet to explain the following:

a) $+3 - +5$

b) $+5 - +3$

c) $-4 - (+6)$

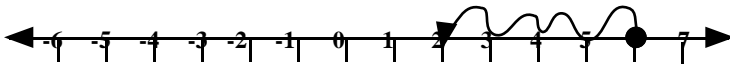
d) $0 - (+4)$

e) $+3 - +3$

f) $-3 - (0)$

2. Match the equation that belongs to the number line:

A

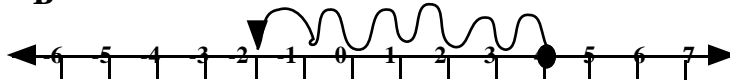


a. $(+6) - (+2) = (+4)$

b. $(+4) - (+6) = (-2)$

c. $(+6) - (+4) = (+2)$

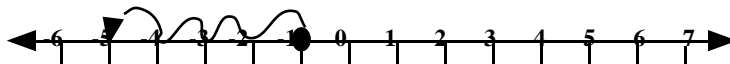
B



b. $(-2) - (-4) = (+6)$

b. $(+4) - (+6) = (-2)$

c. $(+4) - (-2) = (+6)$



a. $(-4) - (-5) = (+1)$

b. $(-1) - (+4) = (-5)$

c. $(-1) - (-5) = (+4)$

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

25. Numbers & Operations

Integers Gr. 8
N-38

Materials: Containers
red (+) and yellow (-) chips
+ and - tiles

1. **Johanne explained $+5 \times -2$ as putting 5 groups of yellow chips into a container for a product of -10 .**

She explained $-6 \times +4$ as taking 6 groups of 4 yellow chips out of a neutral container for a product of -24 .

Try this using the manipulatives and explain this in your own words.

2. **Use Johanne's reasoning to demonstrate and explain**

a) $(-3) \times (-5)$

b) $(+7) \times (+6)$

3. **Paul does not understand Johann's thinking. He says he understands multiplication of integers by using thermometers.**

a) **Draw a thermometer to explain a temperature increase of 2° for 4 consecutive hours.**

b) **Draw a thermometer to explain a temperature decrease of 4° for 4 consecutive hours.**

c) **Can this model be used to explain $(-4) \times (+2)$ and $(-4) \times (-2)$? Explain your answer.**

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

26. Numbers & Operations

Integers Gr. 8
N-38

Materials: red (+) and yellow (-) chips or blocks
+ and - tiles

1. Use two colored chips or + and - tiles to explain the following:

$$(+3) \times (+4)$$

$$(-3) \times (+4)$$

$$(+3) \times (-4)$$

2. Tell why the model breaks down for $(-3) \times (-4)$.
Explain in your own words how to arrive at the answer.

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

27. Numbers & Operations

Integers Gr. 8
N-38, N-77

Materials: calculator

1. a) **Continue this pattern.**

$$(-1)(-1) =$$

$$(-1)(-1)(-1) =$$

$$(-1)(-1)(-1)(-1) =$$

$$(-1)(-1)(-1)(-1)(-1) =$$

$$(-1)(-1)(-1)(-1)(-1)(-1) =$$

- b) **In your own words make a rule for multiplying by (-1).**

2. a) **Continue this pattern:**

$$+3 \times +3 = +9$$

$$+3 \times +2 = +6$$

down by 3

$$+3 \times +1 = +3$$

$$+3 \times 0 = ?$$

$$+3 \times -1 = ?$$

$$+3 \times -2 = ?$$

- b) **From this pattern, explain the rule for multiplying two integers whose signs are different.**

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.

28. Numbers & Operations

Integers Gr. 8
N-38

Materials: red (+) and yellow (-) chips or blocks
+ and - tiles

1. Use two colored chips or + and - tiles to explain the following:

$$(+12) \div (+4)$$

$$(+12) \div (-4)$$

$$(-12) \div (+4)$$

2. Tell why the model breaks down for $(-12) \div (-4)$.
Explain in your own words how to arrive at the answer.

When you have completed this station,
place your activity sheet in your portfolio.
Do not forget to label your entry.

Please tidy up the station.