Title: Integrating Innovative Integers (i^3)

Brief Overview:

This lesson is an interdisciplinary lesson that integrates mathematics, Social Studies, economics and science using real world applications of integers. The lesson planning and implementation of this unit requires collaboration of all four contents, aligning State Curriculum. The following is the math portion of this effort. For this demonstration we chose to focus on Japan

The unit is made to be a collective effort between all the content classes. The other contents will contribute there own portion of the lessons they will teach in their classes based on their own Content standards. They would write their own lessons that would intertwine with the math lesson based on the Social Studies unit chosen.

NCTM Content Standard/National Science Education Standard:

- Develop meaning for integers and represent and compare quantities with them.
- Understand the meaning and effects of arithmetic operations with fractions, decimals, and integers.
- Use representations to model and interpret physical, social, and mathematical phenomena.
- Recognize and apply mathematics in contexts outside of mathematics.
- Solve problems that arise in mathematics and in other contexts.

Grade/Level:

Grades: 7 – 8

Duration/Length:

Three 45–minute periods

Student Outcomes:

Students will be able to:

- Students will recognize and become familiar with integers and manipulating them.
- Through practice and exercise students will be able to solve integer problems quickly and more efficiently.
- Using an integrated approach involving science, social studies, economics, and math will allow students to gain knowledge in different capacities.
- Using these lessons students will gain experience working with temperature conversions, cultural diversity, national debt, geography,

Materials and Resources:

- Timeline Handouts
- Blue painter's tape to represent the timeline
- World map
- Copies of check registers for bank activity (available from local banks)
- Objects from a foreign country such as candy, advertisements, or money (Yen)
- Access to https://www.cia.gov/library/publications/the–world–factbook/geos/jo.html for country elevation data.
- Dry Ice, goggles, tongs, cup of water
- Overhead Projector
- Write–on transparencies and overhead pens
- White boards for students to write on
- Worksheets:
    - Integer Review Drill
    - Timeline Activity – Student Cards
    - Integers in Economics
    - Money Conversions
    - Integers in Science
    - Temperature Conversions

Development/Procedures:

Lesson 1

Preassessment – Identify students' prior knowledge of adding and subtracting integers using the "Integer Review" drill.

Launch – Define "integer" for students a whole number that is positive or negative. Have students brainstorm about how integers show up in their daily life. As students volunteer answers, create a list on poster paper which focuses on the negative integer situations that are shared. Explain to students that they will have the opportunity to explore a country they have never traveled to before. Their job is to gather information about a culture and history involving integers. Divide the class into small groups and have the groups decide on a pre–selected country to study. The list of countries should be pre–selected because there has to be enough information available for students to use.

This was done so no matter what the social studies country they are studying. We picked Japan as our example because I know it's a country covered in Baltimore county Social Studies 6th grade

Teacher Facilitation – This introductory lesson focuses on integers and their uses and manipulation in culture. Our culture is inundated with integers, found in places such as advertisements, time, statistics, etc. Introduce the concept of timelines, which are easy visuals that show relative history in cultures. Timelines can have a negative component in them , when showing time periods such as BC. Extend the discussion to include the concept of time and calendars.

Student Application – Prior to the start of class, cut out the student cards from the "Timeline Activity". Using blue painter's tape, create a timeline on the front blackboard. At the start of the activity, hand out the student cards, one per student or pair of students. Each card describes an event in Japan's history. Have the students, or student pairs, solve their own card and place it on the timeline at the front board. When everyone has solved their year and placed it on the timeline, have student volunteers come to the board and check various cards to verify that each group is correct. This can be a silent activity if you wish.

Embedded Assessment – If the timeline is correctly assembled then students have shown understanding of concepts. However more practice may be needed.

Reteaching/Extension – Several students may need more time or more practice judging by their results from the preassessment and timeline activity. If students still need more practice, algebra tiles can be used to explain negative integers. Students could write their own problems, and then trade with a partner to solve.

Lesson 2

Preassessment – Review students' comprehension of vocabulary terms regarding positive and negative integers. Have the class brainstorm synonyms for positive and negative. Place the synonyms on a large piece of poster paper to hang in the classroom. Examples of synonyms may include gain/loss, plus/minus, deposit/withdrawal, increase/decrease, etc.

Launch – Display foreign candy, literature, food, advertisements, etc. Launch a discussion on the foreign market and how our country exchanges goods with other countries.

Teacher Facilitation – As students enter the room, have the phrase, “Let’s go to the Bank” written on sentence strips. Below this, have the Japanese translation also written on sentence strips:

私達を私達の銀行業をすることを許可しなさい

Introduce this activity by having students imagine that they have access to a bank account. Review deposit and withdrawal procedures with integers. Go through several examples showing negative and positive account balances. Use a random number generator on TI–84 calculators to assign each student their own beginning balance. From this starting point give them transaction numbers representing their account activity. Next use the random generator to choose a lucky number those students will be rewarded for if they are close to that number at the conclusion of the activity.

Student Application – Distribute worksheets “Integers in Economics” and “Money Conversions”.

Embedded Assessment – During “Let’s Go to the Bank” randomly select a sampling of three checking account registers from the class. Check to verify for accuracy.

Reteaching/Extension – If students are struggling with economic integers more practice will be needed. Arrange for one on one instruction during a free period.

Lesson 3

Preassessment – At this point, students should be confident and aware of integers. Motivate students by asking them if they have ever owned money. Ask those students who have owned money if they have ever been in a situation where they had been in debt. If no student can answer these questions, ask studentsto think of a situation where they have experienced negative integers in life. Examples could be a cell phone bill or paying for an expensive electronic device.

To introduce this lesson, divide the class into teams. Have the teams brainstorm where negative numbers may appear in science. Examples could be elevations, negative charges, temperature, time travel, etc. Provide each team with a write–on transparency and an overhead projector pen to

record their lists. Allow each team to present their list to the class. The team that can come up with the most situations wins.

Launch – Prior to the start of class, purchase a small amount of dry ice. (It can be purchased very cheaply, about $5, at grocery stores and gas suppliers). Please review teacher safety at http://www.wrh.noaa.gov/vef/kids/dryice.php before handling dry ice,

Dry Ice is a very cold substance. It is the solid form of carbon dioxide. Using tongs carefully put a few small pieces in a cup of water and watch the famous sublimation (solid to gas skipping the liquid stage) demonstration. Students will have seen this in movies, at Halloween parties, etc. Present the question to students: "Just how cold is dry ice?" Take some guesses. Tell students that it is about –109º F. This example shows students that in science there can be large negative integers. Ask, "What would –109º F be in degrees Celsius?" Provide students with the formula to make this conversion, $C = \frac{5}{9}(F - 32)$. Model the steps to arrive at the solution. Assess student understanding of these steps and the formula by asking them to change other Fahrenheit temperatures into Celsius, such as the day's temperature or record highs and lows for the year.

Extend this concept by having students change Celsius temperatures into Fahrenheit using the formula $F = \left(\frac{9}{5}C\right) + 32$.

Here are some exercises to asses student understanding.

1. $98°F =$ _____ $°C$; $C = \frac{5}{9}(98 - 32) = 36.67°C$
2. $-98°F =$ _____ $°C$; $C = \frac{5}{9}(-98 - 32) = -72.2°C$
3. $75°C =$ _____ $°F$; $F = \left(\frac{9}{5} \cdot 75\right) + 32 = 167°F$
4. $-25°C =$ _____ $°F$; $F = \left(\frac{9}{5} \cdot -25\right) + 32 = -13°F$

Teacher Facilitation – Transition from the launch by using an extreme temperature from one of the states in the United States. Explain to students that there are other interesting facts across the United States that include integers. Display the following examples on an overhead transparency. Note how these examples incorporate integers and science using physical terrain with changes in elevation.

1. You travel from California's Mount Whitney (14,494ft) to Death Valley (–282ft). Your net change in elevation would be 14,494–(–282) = 14,776ft. Drawing a timeline might help show crossing the zero point.

2. Start in Belle Fourche River (3099ft) to its highest point of Gannett Peak of 13,804ft. Your elevation change would be the difference of 3099 and 13,804 = 10,705ft.

Divide the class into their groups from Lesson One. Instruct the groups of students to figure out the net elevation change..

Student Application – Play the game, "Listen to the Integers". This activity will reinforce the manipulation of integers. First have students find a partner and have them sit back to back from each other so one student is facing the front of the room and the other is facing the back. Make sure each group has a writing utensil and scratch paper or a small board to write on. This activity will get loud and is great practice for students listening skills, peer correction, concentration, mental math, speed, and internalization of directions.

Procedure: (students working Independently)

- Write a problem on the overhead, such as $-13-(+14)$
- Have the student who can see the problem write it down on a white board.
- The board then gets passed to the student behind them and they solve the first step.
- This process repeats itself until the problem is solved.
- Students should check each others work from step to step.
- Once they think they have it solved correctly they raise their hands.

Do several more of these problems increasing in difficulty as you go. Then have students switch positions.

Sample problems: (Don't show answers)

	Problem	Answer
1.	$-10-(+10)$	–20
2.	$11-(-10)$	22
3.	$-3-(-3)$	0
4.	$-25+(-7)$	–32
5.	$71-(-5)$	76
6.	$99-(+9)$	90
7.	$-19+(-13)$	–32
8.	$(-2)\cdot(-2)\cdot(-2)$	–8
9.	$4\cdot(-3)\cdot(-2)-(-3)$	27
10.	$13-(-4)+(-2)\cdot 3$	11

Embedded Assessment – Distribute the worksheets "Integers in Science" and "Temperature Conversions".

Summative Assessment:
The assessment is in test format. Another assessment could be a student created brochure outlining the main objectives of the unit. See Summative Assessment Worksheet

Authors:

Kevin Lang
Butler School
Montgomery County

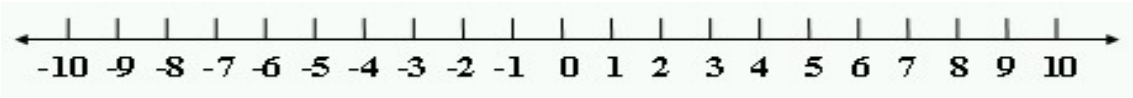
Carolann Sharpe
Golden Ring Middle School
Baltimore County

Integer Review
Drill

Name: _____
Date: _____

Directions: Simplify. Find the answer on the number line. Write the corresponding letter above the answer on the number line to reveal a secret message.

1.	$15 + -17 =$	**(V)**	10.	$-14 + 6 =$	**(N)**
2.	$-87 + 77 =$	**(I)**	11.	$20 + -17 =$	**(T)**
3.	$86 + -79 =$	**(R)**	12.	$-45 + 53 =$	**(S)**
4.	$-3 - (-9) =$	**(E)**	13.	$2 + -7 =$	**(A)**
5.	$-6 + 11 =$	**(G)**	14.	$-7 + 6 =$	**(E)**
6.	$-25 - (-19) =$	**(V)**	15.	$100 + -99 =$	**(I)**
7.	$-8 - (-10) =$	**(N)**	16.	$16 + -12 =$	**(E)**
8.	$8 + -15 =$	**(O)**	17.	$4 + -7 =$	**(I)**
9.	$10 + -19 =$	**(N)**	18.	$-8 + 4 =$	**(T)**



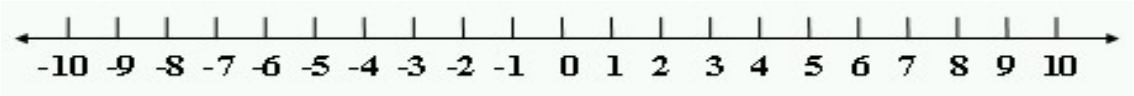
Integer Review
Drill

Name: **_ANSWER KEY___**
Date: _____

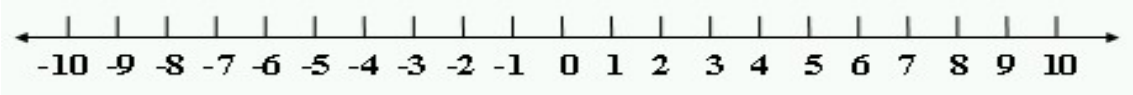
Directions: Simplify. Find the answer on the number line. Write the corresponding letter above the answer on the number line to reveal a secret message.

1. $15 + -17 = -2$ **(V)**
2. $-87 + 77 = -10$ **(I)**
3. $86 + -79 = 7$ **(R)**
4. $-3 - (-9) = 6$ **(E)**
5. $-6 + 11 = 5$ **(G)**
6. $-25 - (-19) = -6$ **(V)**
7. $-8 - (-10) = 2$ **(N)**
8. $8 + -15 = -7$ **(O)**
9. $10 + -19 = -9$ **(N)**
10. $-14 + 6 = -8$ **(N)**
11. $20 + -17 = 3$ **(T)**
12. $-45 + 53 = 8$ **(S)**
13. $2 + -7 = -5$ **(A)**
14. $-7 + 6 = -1$ **(E)**
15. $100 + -99 = 1$ **(I)**
16. $16 + -12 = 4$ **(E)**
17. $4 + -7 = -3$ **(I)**
18. $-8 + 4 = -4$ **(T)**

I NNOVATIVE I NTEGERS



Timeline Activity



Day 1 – Preassessment

Name: Date:

Class Period:

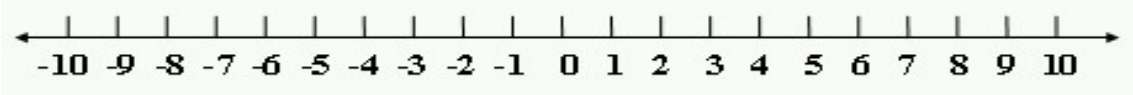
Follow the clues, write the letter of the answer above the correct value and find the secret message.

1. 15 + -17 = **(V)**
2. -87 + 77 = **(I)**
3. 86 + -79 = **(R)**
4. -3 – (-9) = **(E)**
5. -6 + 11 = **(G)**
6. -25 – (- 19) = **(V)**
7. -8 – (-10) = **(N)**
8. 8 + - 15 = **(O)**
9. 10 + -19 = **(N)**

10 -14 + 6 = **(N)**

11. 20 + -17 = **(T)**
12. -45 + 53 = **(S)**
13. 2 + -7 = **(A)**
14. -7 + 6 = **(E)**
15. 100 + -99 = **(I)**
16. 16 + -12 = **(E)**
17. 4 + -7 = **(I)**
18. -8 + 4 = **(T)**

I N N O V A T I V E I N T E G E R S



Day 1 – Preassessment Answers

TEACHER CARDS	STUDENT CARDS
1982: Japanese car firm Honda opens its first plant in the US.	To figure this year find the largest prime number between 10–20. The add 87, multiply by 9, add 37, and multiply by 2. During this year Honda opened it first car firm in the U.S.
1995 January: An earthquake hits central Japan, killing thousands and causing widespread damage. The city of Kobe is hardest hit.	Start with 3000. Subtract negative 1000, divide by 2, and minus 5 to find the year that an earthquake rocked Japan causing lot of damage in the city of Kobe.
1964: Olympic Games held in Tokyo.	Start with the largest 2 digit number you can think of. Multiply this by the smallest prime number between 20–30. Subtract 313 to find out when the Olympic games were held in Tokyo.
1952: Japan regains its independence. The US retains several islands for military use, including Okinawa.	On this year the U.S. gave Japan back its independence but still used several islands for military use. To find this year start with the largest even 3 digit number you can think of. Multiply this by 2 and subtract 32.
1941: Japan launches a surprise attack on the US Pacific fleet at Pearl Harbor, Hawaii. Twelve ships are sunk, with a further 9 damaged; nearly 2,500 people are killed. The US and its main allies declare war on Japan the following day.	This year is infamous in U.S. and Japanese history. Japan attacked Pearl Harbor and because of this the U.S. declared war on Japan. To solve for this year start with –9 and multiply this by negative 13. Add 530 and multiply by 3.

Teacher cards were taken from http://news.bbc.co.uk/1/hi/world/asiapacific/country_profiles/1261918.stm, http://photo.net/japan/timeline

1923: Earthquake in Tokyo region kills more than 100,000 people.	To find out the year that a massive earthquake hit Tokyo start with the product of –34 and –25. Add the product of –12 and –10. Finally multiply by 2 and subtract 17.
1910: Japan annexes Korea after three years of fighting. Japan is now one of the world's great powers.	This is the year that Japan was recognized as a world power after annexing Korea. To find this year divide –125 by negative 100. Combine this with the product of –35 and 25. Finally add 2800 and subtract 16.25.
1894: Japan goes to war with China. Japan's better equipped forces win victory in just nine months.	To find the year that China and Japan fought each other with Japan winning the battle start out with the largest prime number between 30–40. Multiply this number by five squared and combine this with the product of –31 and –31. Finally add 8.
1868: Restoration of imperial rule (Meiji Restoration); Tokyo becomes capital	This is the year Tokyo became the capital of Japan. Start out by multiplying the two largest prime numbers between 1 and 50. Finally add a negative 153 to solve.
1707: Mount Fuji erupts	On this year Mount Fuji erupted. Start out by multiplying –14 and negative 15. Next subtract a negative 1000. Finally add 500 and subtract the 2nd smallest prime number.

1614: Christianity banned	To find out the year that Christianity was banned in Japan solve the following clue. Start out by dividing negative 5000 by –5. Combine this with 25 squared and then subtract 11.
1467–77: Onin civil war; Kyoto burned	The 10–year Onin civil war began during this year destroying the town of Kyoto in a fire. To find this year start out with (-30^2). Combine this with the product of 16 and 15. Finally combine this with the product of 109 and 3.
1274: Mongol invasion	When did the Mongol's invade Japan? Solve to find out. Start with the largest even 3 digit number, multiply by 1.5, and add a negative 223.
AD 607: first Buddhist temples built in Nara	The first Buddhist temples were found in Nara, Japan in this year. Start with 2500, multiply by negative .25, and subtract 1232.
14,500 BC: Jomon hunting and gathering society	When was the Jomon hunting and gathering society found in modern day Japan? Start with –100 divided by 4. Square your answer, add a negative 6000, and multiply by 2. Finally add –1250.

Integers in Economics

Name: _____
Date: _____

Japan trades goods with the entire world. Countries buy goods like radios and TV's from Japan and Japan buys things like gasoline and foods that are not grown in their country from other places. A country keeps a tally of how much they are "Worth" called the Gross Domestic Product (GDP).

The GDP of a country in a given period of time is found using the following formula:

GDP = consumption + investment + (government spending) + (− imports)

1. Calculate Japan's GDP using the following information.

   Japan's GDP was $4.218 trillion in 2006. If there was –0.7 trillion change in 2007, what will be the GDP for 2007?_____

2. Japan has revenues of $1.411 trillion and expenditures of $1.639 trillion, which includes capital expenditures of about $71 billion (2006 est.). What is the difference of what is made (revenue) and what is spent (expenses)?
   _____

3. If the answer in question 2 is a negative, this is called National Debit. If the answer in question 2 is a positive, it's called a surplus. For the year 2006, does Japan have a surplus or debit? Explain your answer using numbers, symbols or words._____
   _____
   _____
   _____
   _____
   _____
   _____

Money Conversions

Name: _____
Date: _____

In the Japan, the money is called Yen. One Yen is equal to less then one US Dollar. It takes 123 Yen to make 1 US dollar.

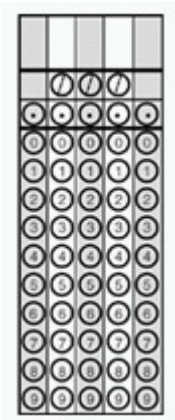
1. To find out how many Yen 1 US Dollar buys, you would divide 1 US dollar by the amount of Yen it is equal to. What is the amount of US Dollars one Yen will buy? (Round to the nearest thousandths)

2. You found an MP3 player for 9717 Yen. How many US Dollars will it cost?

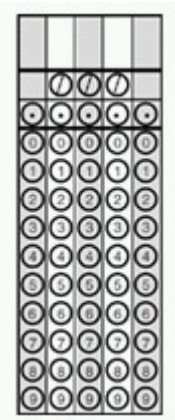
3. Your travel agent said it was going to be $59.00 a night to stay at the hotel. You have 1000 Yen in your pocket. How many more dollars will you need to exchange to pay your bill for one nights stay? (Round to the nearest dollar)

4. You are going out for lunch and you see a McDonalds®. The Big Mac® is listed for 492 Yen. You give the cashier 500 Yen. How many Yen will you get back?

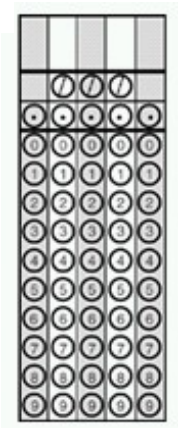
#1



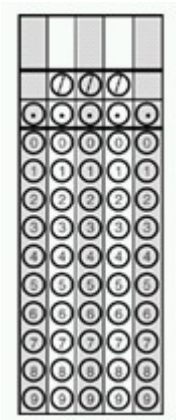
#2



#3



#4



5. Write an expression that would represent the following situation using integers and operations then solve.

You have exchange $200 dollars into Yen. You then purchase tickets to a Japanese Festivals or 'Matsuri' for 738 Yen. You purchase some Sushi at the festival for 1230 Yen and then you take a taxi back to your hotel for 1599 Yen. You purchase a Seiko watch in the lobby gift shop for your friend. It cost 6765 Yen. You withdraw another 1430 Yen from a Daishi Bank ATM machine at the hotel. How much, if any, money do you have left in US dollars?

_____
_____
_____
_____
_____

Integers in Economics Day 2

Integers in Economics

Name: **_ANSWER KEY___**
Date: _____

Japan trades goods with the entire world. Countries buy goods like radios and TV's from Japan and Japan buys things like gasoline and foods that are not grown in their country from other places. A country keeps a tally of how much they are "Worth" called the Gross Domestic Product (GDP).

The GDP of a country in a given period of time is found using the following formula:

GDP = consumption + investment + (government spending) + (− imports)

1.

Integers in Economics (Worksheet 2A Answer Key)

Name_____ **Date_____**
Class Period_____

Let's familiarize ourselves with some of Japan's financial characteristics. Japan trades goods with the entire world. Countries buy goods like radios and TV's from Japan and Japan buys things like gasoline and foods that are not grown in their country from other places. A country keeps a tally of how much they are "Worth" called the Gross Domestic Product (GDP).

The GDP of a country in a given period of time is found using the following *GDP = consumption + investment + (government spending) + (exports − imports)*

Calculate Japan's GDP using the following information.

Japan's GDP was $4.218 trillion in 2006. If there was –0.7 trillion change in 2007, what will be the GDP for 2007?___3.518 Trillion_____

2. Japan has revenues of $1.411 trillion and expenditures of $1.639 trillion which includes capital expenditures of about $71 billion (2006 est.) What is the difference of what is made (revenue) and what is spent (expenses)?

   _____–.288_____

3. If the answer in question 2 is a negative, this is called National Debit. If the answer in question 2 is a positive, it's called a surplus. For the year 2006, does Japan have a surplus or debit? Explain your answer using numbers, symbols or words.

   The revenue is a positive number and the expenses are negative numbers. You add them together and you have 1.411 + –1.639 = –.288 Trillion or – 288 Billion

Money Conversions

Name: **_ANSWER KEY___**
Date: _____

In the Japan, the money is called Yen. One Yen is equal to less then one US Dollar. It takes 123 Yen to make 1 US dollar.

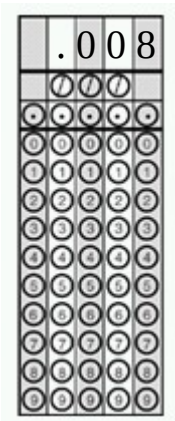
1. To find out how many Yen 1 US Dollar buys, you would divide 1 US dollar by the amount of Yen it is equal to. What is the amount of US Dollars one Yen will buy? (Round to the nearest thousandths)

2. You found an MP3 player for 9717 Yen. How many US Dollars will it cost?

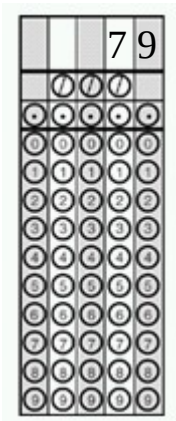
3. Your travel agent said it was going to be $59.00 a night to stay at the hotel. You have 1000 Yen in your pocket. How many more dollars will you need to exchange to pay your bill for one nights stay? (Round to the nearest dollar)

4. You are going out for lunch and you see a McDonalds®. The Big Mac® is listed for 492 Yen. You give the cashier 500 Yen. How many Yen will you get back?

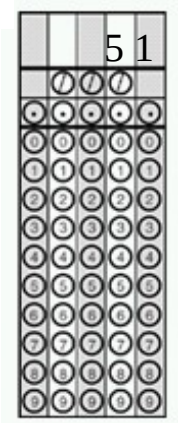
#1



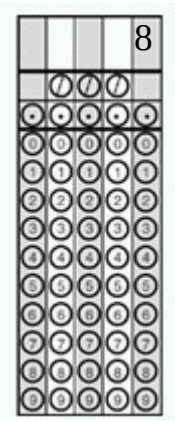
#2



#3



#4



5. Write an expression that would represent the following situation using integers and operations then solve.

You have exchange $200 dollars into Yen. You then purchase tickets to a Japanese Festivals or 'Matsuri' for 738 Yen. You purchase some Sushi at the festival for 1230 Yen and then you take a taxi back to your hotel for 1599 Yen. You purchase a Seiko watch in the lobby gift shop for your friend. It cost 6765 Yen. You withdraw another 1430 Yen from a Daishi Bank ATM machine at the hotel. How much, if any, money do you have left in US dollars?

$$(200 \cdot 123) + -738 + -1230 + -1599 + 1430 = 22463$$

$$\frac{22463}{123} = 182.63$$

Integers in Science

Name: _____
Date: _____

Japan's highest point, Mount Fuji is 3,776 meters above sea level. Its lowest point, Hachiro–gata, is 4 m above sea level.

1. What is the net change in elevation if you were to travel from these 2 points?
   _____

2. On your trip to decide to scuba dive off the coast of Japan and you reach a depth of 110 meters before going back up. What integer best represents this situation?
   _____

3. On your next dive you go ever deeper and reach 204 m below sea level. What is the difference between your two depths? _____

4. When you get back home you try to figure out your net change in elevation throughout your trip. Here is the information you remembered:

   Your hometown is 1200m above sea level. Your flight reached a height of 10,000m. You visited the following towns and sights: Tokyo Airport 12m and Osaka 15m. Your diving trip in the ocean took you to a depth of 110 m and 204m. On your flight home you reached the same height.

   Please record your running total to show your work..

_____
_____
_____
_____
_____
_____
_____
_____

Temperature Conversions Name: _____

In the United States the temperature is measured in degrees Fahrenheit. However in many other countries temperature is measured in degrees Celsius. It can be confusing using both scales so let's learn how to convert one to the other.

Use the following equations to convert each temperature:

- °C = (°F - 32) * 5 / 9
- °F = (°C * 1.8) + 32

$$F = \left(\frac{9}{5}C\right) + 32 \qquad C = \frac{5}{9}(F - 32)$$

	Degrees Fahrenheit		Degrees Celsius
1.	100° F	=	
2.	50° F	=	
3.	0° F	=	
4.	–32° F	=	
5.	–77° F	=	
6.		=	100° C
7.		=	50° C
8.		=	0° C

Analysis

9. Based on your calculations, which is warmer 100° F or 100°C? Please explain.

_____

_____

10. What about 0°C or 0°F which is colder and why?

Integers in Science

Name: __**ANSWER KEY**__
Date: _____

Japan's highest point, Mount Fuji is 3,776 meters above sea level. Its lowest point, Hachiro–gata, is 4 m above sea level.

1. What is the net change in elevation if you were to travel from these 2 points? _____**3772m**_____

2. On your trip to decide to scuba dive off the coast of Japan and you reach a depth of 110 meters before going back up. What integer best represents this situation? **–110m**_____

3. On your next dive you go ever deeper and reach 204 m below sea level.What is the difference between your two depths? _____**–94m**_____

4. When you get back home you try to figure out your net change in elevation throughout your trip. Here is the information you remembered:

   Your hometown is 1200m above sea level. Your flight reached a height of 10,000m. You landed in Tokyo (12m) and visited Osaka (15m). Your diving trip in the ocean took you to a depth of 110 m and 204m. On your flight home you reached the same height.

   Please record your running total to show your work.

_____**10,000m–1200m = +8,800m; Landing in Tokyo (–8788m) to leave us at +12 m; traveling to Osaka (+3m) = 15m total; diving 110m and then 204m below sea level cancels out since we have to come back up; We assume going back to Tokyo and flying home at the same altitude gives us a net change of zero.**__

Temperature Conversions Name: _____

In the United States the temperature is measured in degrees Fahrenheit. However in many other countries temperature is measured in degrees Celsius. It can be confusing using both scales so let's learn how to convert one to the other.

Use the following equations to convert each temperature:

$$F = \left(\frac{9}{5}C\right) + 32 \qquad C = \frac{5}{9}(F - 32)$$

	Degrees Fahrenheit		Degrees Celsius
1.	100° F	=	38.7° C
2.	50° F	=	10° C
3.	0° F	=	__–17.8° C
4.	–32° F	=	__–35.6° C
5.	–77° F	=	_–60.6° C __°
6.	212° F	=	100° C
7.	122° F	=	50° C
8.	32° F	=	0° C

Analysis

9. Based on your calculations, which is warmer 100° F or 100°C? Please explain.

__100° C is equivalent to 212° F, so 100° C is warmer_____

10. What about 0°C or 0°F which is colder and why?

__0°C is the same as 32° F but 0° F is –17.8° C, so 0° F is colder.

_____

さようなら Japan (Summative Assessment)

Name_____ Date_____

You have taken a trip to Japan and learned about their Culture, Money, Business, and Geography. Answer the following questions based on what you have learned.

1. You have converted Celsius and Fahrenheit. Which one makes more “sense” to use based on what you know about integers and zero.

_____
_____
_____
_____
_____

2. When you return from your trip, you have late pay notices in your mailbox. You decide to set up a bill payment withdrawal from your checking account to avoid late fees in the future. You list all your reoccurring bills and record the withdrawal from your check register. You have the following monthly bills:

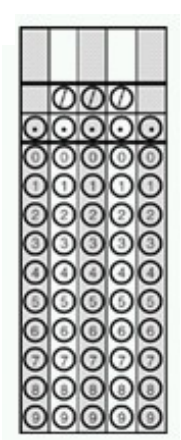
Electric: $125	Rent: $800
Car Payment: $210	Insurance: $111
Phone: $79	Health Club Membership: $35

Using integers represent how much money you have at the end of the month after your direct deposit of your paychecks for $950 twice a month.

_____

3. 40,000 BC Marked the Stone age in Aichi and Tochigi. Father Loyola Xavier established Jesuit Mission at Kagoshima in 1549 AD. How many years between the two events?

#3



さようなら Japan (Summative Assessment)

Name_____ Date_____

You have taken a trip to Japan and learned about their Culture, Money, Business, and Geography. Answer the following questions based on what you have learned.

1. You have converted Celsius and Fahrenheit. Which one makes more "sense" to use based on what you know about integers and zero.
Example answer – The Celsius makes more sense because freezing is at zero and things below zero are negative and mean below freezing and above zero are above freezing. Below Freezing when in Fahrenheit positive numbers below 32 are freezing and its not as logical as it being below zero.

2. When you return from your trip, you have late pay notices in your mailbox. You decide to set up a bill payment withdrawal from your checking account to avoid late fees in the future. You list all your reoccurring bills and record the withdrawal from your check register. You have the following monthly bills:

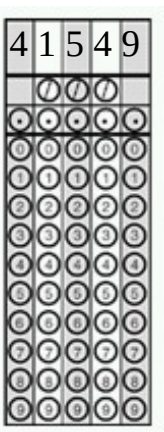
Electric: $125	Rent: $800
Car Payment: $210	Insurance: $111
Phone: $79	Health Club Membership: $35

Using integers represent how much money you have at the end of the month after your direct deposit of your paychecks for $950 twice a month.

950 + 950 + (–125) + (–210) + (–79) + (–800) + (–111) + (–35) = 540

3. 40,000 BC Marked the Stone age in Aichi and Tochigi. Father Loyola Xavier established Jesuit Mission at Kagoshima in 1549 AD. How many years between the two events?

#3



References:

Dry Ice Safety. http://www.wrh.noaa.gov/vef/kids/dryice.php Webmaster US Dept of Commerce National Oceanic and Atmospheric Administration National Weather Service Las Vegas Weather Forecast Office 7851 S Dean Martin Dr. Las Vegas, NV 89139–6628.

Elevations and Distances in the United States Online Edition. http://erg.usgs.gov/isb/pubs/booklets/elvadist/elvadist.html#Highest U.S. Department of the Interior U.S. Geological Survey 509 National Center, Reston, VA 20192, USA.

Japan National Tourist Organization. http://www.seejapan.co.uk/fseedo.html ©Japan National Tourist Organization.

Money. http://www.k111.k12.il.us/King/japan18b.htm

Number and Operations Standard for Grades 6–8. http://standards.nctm.org/document/chapter6/numb.htm Copyright © 2000–2004 by the National Council of Teachers of Mathematics.

Temperature Conversion: Convert between Celsius, Kelvin, and Fahrenheit http://ostermiller.org/calc/temperature.html Copyright Stephen Ostermiller 2001–2006.

The World Factbook: Japan.https://www.cia.gov/library/publications/the–world–factbook/print/ja.html

Oualistream Daishi Bank. http://www.qualisteam.com/Detailed/2637.html Qualisteam ©1995–2007.

Works Cited:

Timeline History. http://photo.net/japan/timeline © 2000–2007 Luminal Path Corporation and contributors. Contributed content used with permission.

Timeline: Japan A Chronology of Key Events. http://news.bbc.co.uk/1/hi/world/asia–pacific/country_profiles/1261918.stm BBC News UK