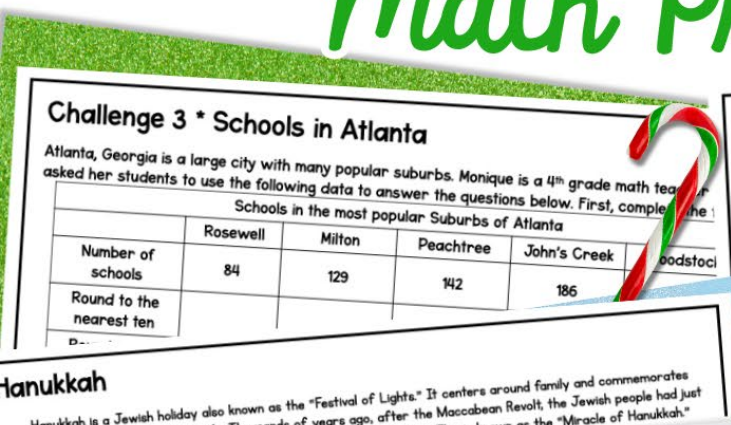
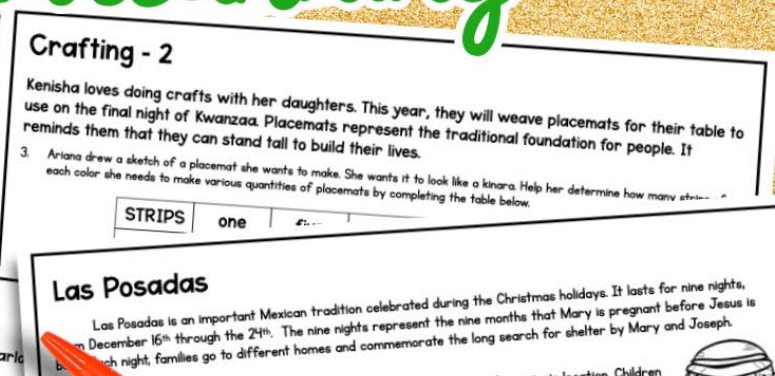
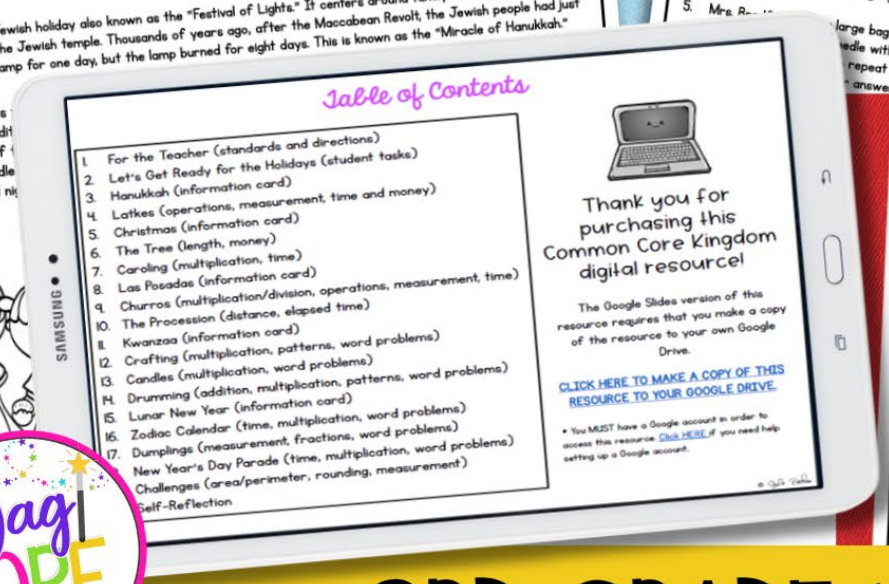
HOLIDAY HELPING HANDS

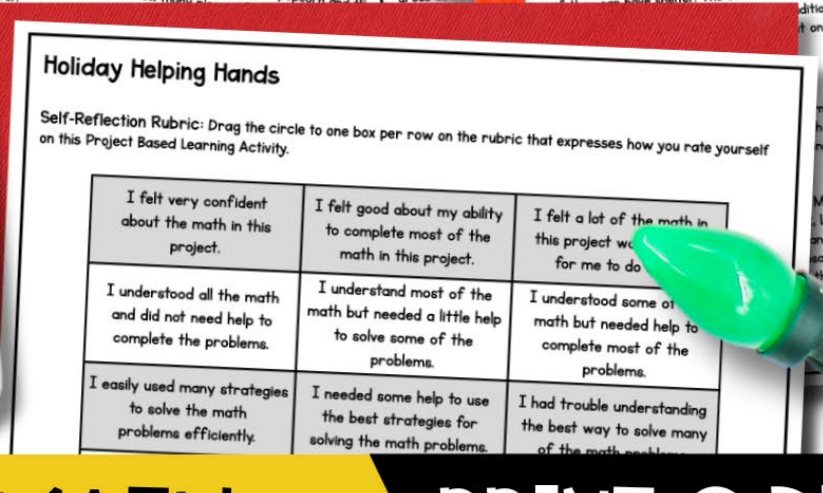
Math Project Based Learning













3RD GRADE MATH

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For the Teacher

Celebrating Winter Holidays is a Project Based Learning activity that provides students with a variety of engaging and fun math challenges as they help different families prepare for their special winter holidays. Your students will practice the following math standards:

- 3.OA.A.1 Interpret products of whole numbers.
- 3.OA.A.2 Interpret whole number quotients of whole numbers.
- 3.OA.A.3 Use multiplication and division within 100 to solve word problems involving equal groups, arrays, and measurement quantities.
- 3.OA.B.5 Apply properties of operations as strategies to multiply and divide.
- 3.OA.C.7 Fluently multiply and divide within 100.
- 3.OA.D.8 Solve two-step word problems using the four operations.
- 3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100.
- 3.NBT.A.2 Fluently add and subtract within 1000 using strategies and algorithms based on properties of operations.
- 3.NBT.A.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90.
- 3.NF.A.1 Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts.
- 3.MD.A.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes.
- 3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams, kilograms, and liters.
- 3.MD.C.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.
- 3.MD.C.7 Relate area to the operations of multiplication and addition.
- 3.MD.D.8 Solve real world and mathematical problems involving perimeter.

Directions:

1. Decide if your class will complete the project as a whole group, in small groups, or independently.
2. Copy packets and provide students with materials necessary to complete the packet.
3. Students should complete the project over several days.
4. Preview the activity with your students.
5. Challenge activities can be assigned or can be optional.
6. Students will complete the self-evaluation reflection rubric.
7. Allow students an opportunity to share their completed projects.



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Let's Get Ready for the Holidays!

Who doesn't love celebrating holidays? All the fun and excitement we experience takes a lot of time and energy to plan. Usually, it is the parents of the family who do the planning. In this project, you will meet five families who celebrate different winter holidays. They all need your help to prepare to celebrate. So, let's get started!

Here are your tasks:

- Read through the entire packet before beginning.
- Read the holiday informational slides one at a time.
- Read the questions to become familiar with the types of

math problems you will be solving.

- Complete each section before moving on to the next.
- (Optional) Complete the challenge pages.
- Complete the self-reflection and evaluation rubric.



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Hanukkah

Hanukkah is a Jewish holiday also known as the "Festival of Lights." It centers around family and commemorates the rededication of the Jewish temple. Thousands of years ago, after the Maccabean Revolt, the Jewish people had just enough oil to burn a lamp for one day, but the lamp burned for eight days. This is known as the "Miracle of Hanukkah."



Hanukkah lasts for eight days and usually occurs sometime in December. Jewish families celebrate many traditions and rituals during the eight days of the holiday. Lighting the menorah is a very big part of the celebration. A menorah is a candelabrum with nine candles. Each day after sunset, a candle is lit using only the middle candle, called the "shammash," or helper candle. By the final night of Hanukkah, all nine candles are lit.



Children play the Dreidel game. They spin the top and follow the directions as they pass gold coins called Gelt. Families also enjoy singing songs each evening and exchanging small gifts.

Families share traditional foods during Hanukkah. They eat foods that are fried in oil to represent the miracle of the burning oil lamp. Some favorites are potato latkes, doughnuts, and fritters.

Now, let's meet the Abrams family. Mr. Abrams is a single dad who will be celebrating Hanukkah with his two children, 7-year-old Naomi and 10-year-old Micah. They are a Jewish family living in New York City and they love celebrating Hanukkah. You will be helping them prepare latkes for this year's holiday.

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Latkes - 1

The Abrams family will make latkes during each night of Hanukkah. The first six nights, they will make 4 servings. On the 7th and 8th nights, they will celebrate with relatives, so they will make more. The Abrams will make 8 servings on the 7th night and 16 servings on the 8th night. Use the table to answer the questions below.

Ingredients	4 servings	8 servings	16 servings
potatoes	2	4	8
eggs	1	2	4
chopped onions	¼ cup	½ cup	1 cup
flour	1 tablespoon	2 tablespoons	4 tablespoons
oil	½ cup	1 cup	2 cups

1. How many latkes will the Abrams make during the eight nights of Hannukah? Show how you know.

2. How many potatoes will the Abrams need to buy to make enough latkes for the 8 nights of Hanukkah? Show your thinking using the number line.

3. Naomi looks at the table and says she knows that they will need half the number of eggs as potatoes. Is she correct? Explain.



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Christmas

Christmas is a holiday celebrated by Christians all around the world. It celebrates the birth of Jesus Christ. No one really knows the exact day Jesus was born, but it is believed to be sometime in December or January. Often, the celebration takes place from the beginning of December until after New Year's Day on January 1st.



Traditional decorations and festivities can be observed around the globe. Many people decorate a Christmas tree in their home with lights and ornaments. Some decorate the outside of their homes with lights or place lights in their windows. Families often go caroling and children participate in Christmas pageants. They also display nativity sets and hang stockings in their homes. It is customary to send Christmas cards to friends and family, especially to those who live far away.

Baking cookies, stringing popcorn garland, and hanging evergreen wreaths on front doors are Christmas traditions loved by many people during the Christmas season. Singing Christmas carols is a favorite pastime of families. Christmas music can be heard in homes, schools, and on the radio during the holiday season. Many families also watch Christmas movies together.



On Christmas Eve or Christmas Day, families wake early to open gifts. Some families attend church services. Later, they get together with extended family to exchange gifts and eat a festive meal.

Let's meet the Bradford family. Mr. and Mrs. Bradford live in a small town in central Indiana with their daughters, Mia, who is 13, Ana, who is 10, and Kira, who is 7. They love celebrating Christmas with family and friends. You will be helping the Bradford family prepare for the busy Christmas holiday.

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The Tree - 1

The Bradford family loves to cut down their own Christmas Tree. Each year, they go to their local tree farm and pick out their favorite tree. Help the Bradford family pick the best tree this year.

	5 – 5 ½ feet tall	5 ½ – 6 feet tall	6 – 6 ½ feet tall	6 ½ – 7 feet tall	Above 7 feet tall
Blue Spruce	$22.50	$25.75	$29.25	$39.50	Add $1.00 per inch

1. The ceiling in the living room is 7 ½ feet from the floor. The tree will sit 3 inches off the floor in a tree stand. Mrs. Bradford wants to be sure that they buy a tree that will allow her to use the new star topper she purchased. The star is 7 inches tall. What is the largest tree the Bradfords can purchase? Draw a model to show your work.

2. Mia found a tree she loves that is 8 ½ feet tall. What is the least number of inches Mr. Bradford can cut off the bottom of the tree so that it will fit in their living room? Draw a model to show your work.



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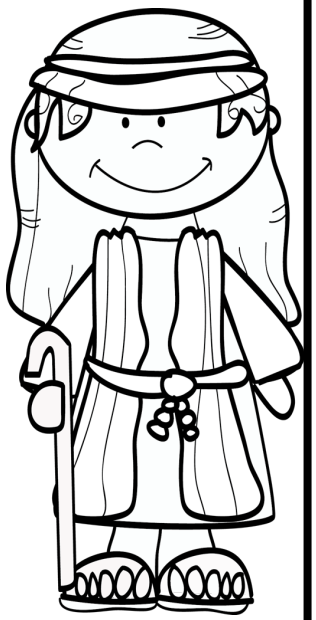
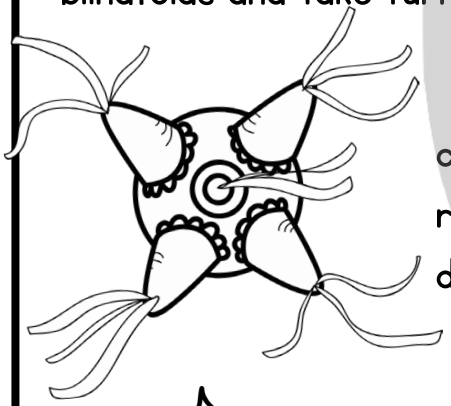
Las Posadas

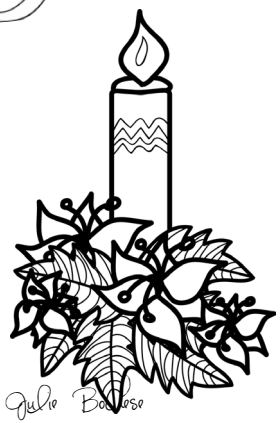
Las Posadas is an important Mexican tradition celebrated during the Christmas holidays. It lasts for nine nights, from December 16th through the 24th. The nine nights represent the nine months that Mary is pregnant before Jesus is born. Each night, families go to different homes and commemorate the long search for shelter by Mary and Joseph.



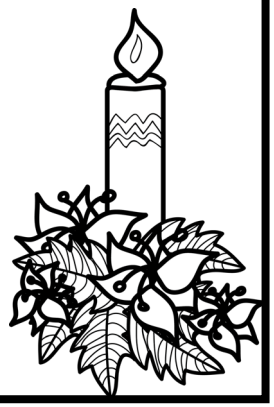
Starting at dusk, families form processions and walk together to each evening's location. Children dress as shepherds or angels and adults carry candles and religious figures. When they arrive at the home, they ask the owner if they can have shelter. The owner of the home says yes and lets everyone inside. Together, they celebrate with prayers, festive songs, and traditional food. The evening ends with the breaking of a piñata, which is in the shape of a star. Children put on blindfolds and take turns hitting the piñata until it breaks and spills out goodies!



This nine-night tradition ends on Christmas Eve. On this evening, the celebration continues with a Christmas church service. The processions represent a pilgrimage, which is a journey to find meaning or a religious devotion. All participants share their love for Christmas.



Let's meet the Garcia family. Mr. and Mrs. Garcia live with their three children in southern New Mexico. Pedro is 12, Luis is 9, and Maria is 6. Also living with the family is Abuela and Abuelo, or grandmother and grandfather. The family has deep faith and loves celebrating Las Posadas more than any other holiday. You will be helping the Garcias prepare to host the last evening of Las Posadas.



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Churros - 2

Use Abuela's recipe to answer the questions below.

4. Mr. Garcia created a table using Abuela's recipe to list the correct amount of each ingredient for different size batches. He did not finish adding the numbers into the chart. Fill in the missing numbers for Mr. Garcia.

	Water	Butter	Sugar	Vanilla	Flour	Salt	Eggs	Oil
1 batch	1 cup	½ cup	2 Tbs.	1 tsp.	1 cup	1 tsp.	2	3 cups
2 batches	2 cups	1 cup.		2 tsp.	2 cups	2 tsp.	4	6 cups
3 batches	3 cups	1 ½ cups		3 tsp.		3 tsp.	6	
4 batches	4 cups	2 cups.	8 Tbs.	4 tsp.	4 cups	4 tsp.		
5 batches	5 cups			5 tsp.	5 cups	5 tsp.	10	
6 batches	6 cups			6 tsp.	6 cups	6 tsp.		
7 batches	7 cups			7 tsp.		7 tsp.		21 cups
8 batches	8 cups		16 Tbs.	8 tsp.		8 tsp.		

Abuela's Churros

Ingredients:

1 cup of water
½ cup of melted butter
2 tablespoons of sugar
1 teaspoon of vanilla
1 cup of flour
1 teaspoon of salt
2 eggs
3 cups of vegetable oil for frying

Churros Coating:

¾ cup of cinnamon-sugar
½ bag of chocolate chips



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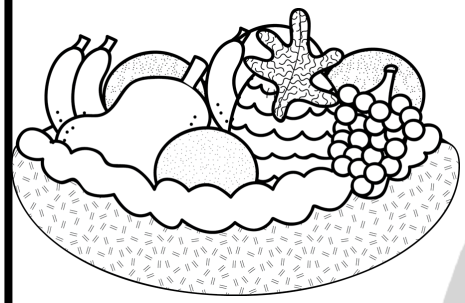
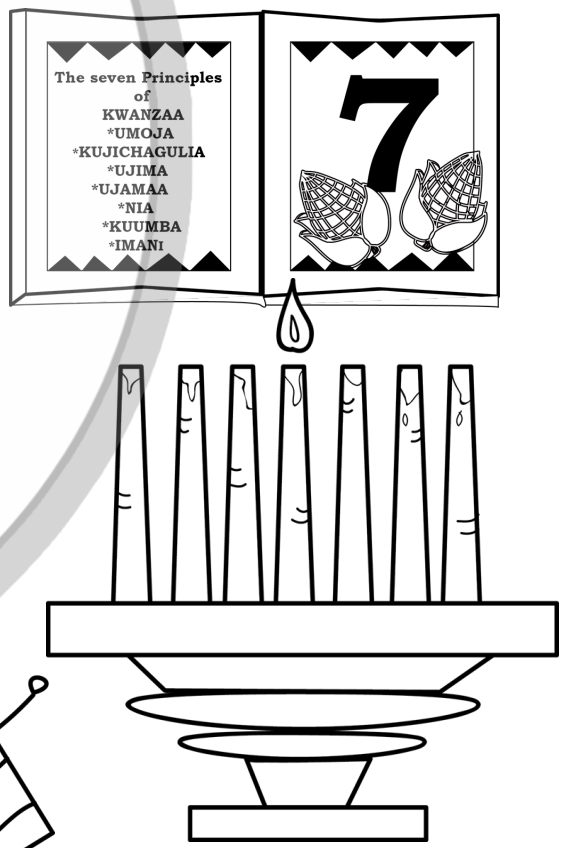
Kwanzaa

Kwanzaa is a celebration that honors African-American beliefs and traditions. It begins the day after Christmas and lasts until January 1st. After a week of celebrations, the holiday ends with a big feast and and exchanging of gifts.

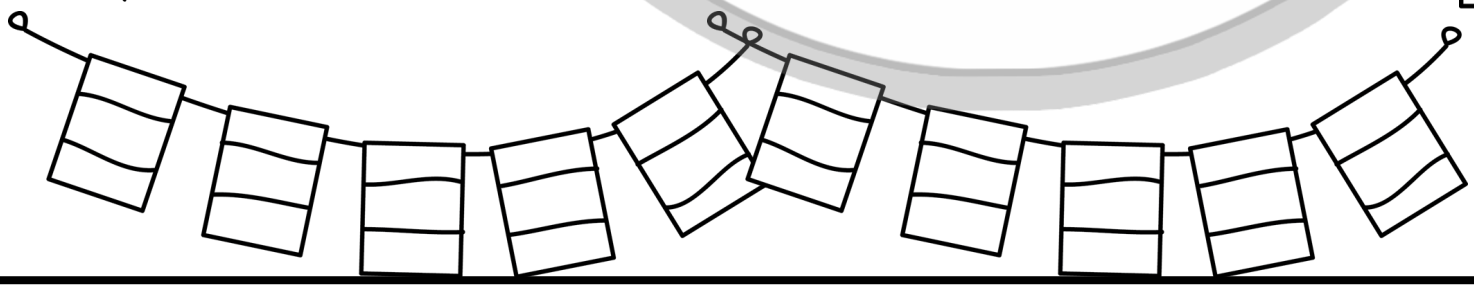


Dr. Karenga, a college professor of African studies, introduced the holiday in California around 1965. His idea was to create a celebration that unites the African-American community. The word Kwanzaa means "first fruits" or "harvest." People enjoy the holiday with singing, drumming, dancing, storytelling, crafting, and feasting. One common tradition of Kwanzaa is gift giving. Families focus less on spending money on gifts in order to avoid making the holiday mostly about gifts. Instead, people often make presents for loved ones.

There are seven principles that represent African values and are central to the celebration of Kwanzaa. Each day the family focuses on a different value. A candle is lit on a holder called a kinara. It holds seven candles, one for each day, and is a lot like a Jewish menorah. On the first day, families enjoy a sense of unity which is discussed throughout the week. On the final day of Kwanzaa, people gather to share an African feast, called karamu.



Kenisha and Monique Williams live in Atlanta, Georgia, with their adopted children, Arianna, age 8, and Cassie, age 9. They are proud to celebrate Kwanzaa with their friends and families. Your task is to help the family prepare for the holiday.



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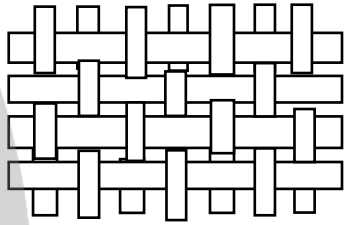
Crafting - 2

Kenisha loves doing crafts with her daughters. This year, they will weave placemats for their table to use on the final night of Kwanzaa. Placemats represent the traditional foundation for people. It reminds them that they can stand tall to build their lives.

3. Ariana drew a sketch of a placemat she wants to make. She wants it to look like a kinara. Help her determine how many strips of each color she needs to make various quantities of placemats by completing the table below.

STRIPS	one	five	ten	fifteen	twenty
Gold	4	20			
Red	3		30		
Black	1			15	
Green	3				60



4. Use the completed table to calculate how many strips of each color Kenisha and Ariana will need to make the correct number of placemats for their Kwanzaa feast. Show how you know.

GOLD =

RED =

BLACK =

GREEN =

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Lunar New Year

Lunar New Year is the most important holiday celebrated in Asian countries including China, South Korea, Vietnam, and Singapore. The celebration is also known as the Lunar New Year. It is celebrated sometime in January or February and depends on the Chinese zodiac calendar. The zodiac calendar has a cycle of twelve years. Each year honors one of the twelve zodiac animals: rat, ox, tiger, rabbit, dragon, snake, horse, goat, monkey, rooster, dog, and pig.

The celebration is filled with many festivities, and it lasts for two weeks. The focus of the holiday is to celebrate a year of hard work and to look forward to a lucky and prosperous year ahead. It is thought that a good start to the lunar year will lead to a lucky year.

Gifts of money are exchanged during Lunar New Year in red envelopes. Red is a symbol of hope and luck. Eating fish is a must for the celebrations. It is believed that fish will bring a surplus of money and luck in the coming year. Other traditional foods eaten during this celebration include dumplings, spring rolls, and rice.

At midnight, on New Year's Eve, it is tradition to set off firecrackers as a way of sending out the old year and bringing in the new one. Two traditional dances are performed on New Year's Day. One is the dragon dance, and the other is the lion dance. Families visit temples on New Year's Day and believe it will help smooth the way for a good year ahead.

Let's meet the Wei family. Mr. and Mrs. Wei live in Portland, Oregon with their two children, Kevin, who is 13, and Ruby, who is 8. You will help the Wei family plan for this year's Lunar New Year.



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Zodiac Calendar

The Chinese believe that each zodiac animal has specific personality traits, and that people will have similar personalities to the zodiac animal of their birth year. People do not celebrate their actual birthday, but instead, they celebrate the year they were born.

1. Ruby will turn 8 years old this year, just before Lunar New Year. She was born in the Year of the Snake. How many more years will it be until she will celebrate the Year of the Snake for the first time since she was born? Show with subtraction.

2. Kevin was born in the Year of the Dragon. He will be thirteen years old when his family celebrates this new year. He thinks there are nine more years before it will be the Year of Dragon again. Is he correct? Explain.

3. Mr. and Mrs. Wei were born in the same year, the Year of the Tiger. This year, they will celebrate the Year of the Tiger again. Circle two possible ages Mr. and Mrs. Wei could be this year

a. 36 b. 44 c. 38 d. 48 e. 40 f. 42



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New Year's Day Parade - 2

The Wei family loves to go to downtown Portland for their annual Lunar New Year Parade. This year's parade is on a Sunday and begins at 2:00 pm. Help them plan their trip to the city.

4. The parade route is one mile long. The dragon will take about 50 minutes to get from the beginning of Main Street to the end. The Wei family found a good viewing spot that is located at the half-way point on the parade route. If they got to their viewing spot at 1:38 pm, how long did they wait to see the dragon pass by? Explain how you know.

5. The parade lasts for 73 minutes. At about what time did the parade end? Show your thinking.

6. At 3:30 pm, the Wei family began the 17-minute walk back to their car. They had to wait for 29 minutes before they could exit the parking lot due to all the cars. What time did they leave the parking lot? Use the number line to show your thinking.



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Challenge 1 * Wrapping Gifts

Mr. Bradford loves to wrap gifts. He precisely measures the paper and ribbon and creates beautiful packages to put under the Christmas Tree. Help Mr. Bradford wrap the gifts this year.

1. Mr. Bradford bought a new roll of wrapping paper that is 275 inches long and 24 inches wide. He will wrap 5 clothing boxes that are 3 inches tall, 12 inches wide, and 24 inches long. He knows the paper can only fit completely around each box in one direction in order to cover all the sides. If he precuts the paper for the 5 boxes and adds one inch to each length to allow for overlap, how many inches long will each piece be? Draw a sketch to illustrate your thinking.

2. Mr. Bradford always adds fabric ribbon to his packages. He needs 108 inches of ribbon for each box. He buys ribbon by the inch at the fabric store. He wants to buy enough ribbon to decorate the 5 boxes he wrapped, plus he wants to buy one extra foot of ribbon just to be sure he has enough. How many inches does he need to buy?

3. Calculate how many feet of ribbon Mr. Bradford bought.



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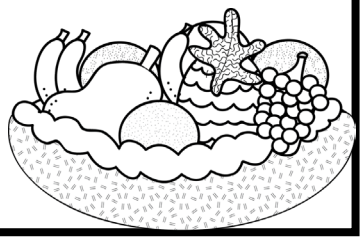
Challenge 3 * Schools in Atlanta

Atlanta, Georgia is a large city with many popular suburbs. Monique is a 4th grade math teacher who asked her students to use the following data to answer the questions below. First, complete the table.

Schools in the most popular Suburbs of Atlanta					
	Rosewell	Milton	Peachtree	John's Creek	Woodstock
Number of schools	84	129	142	186	57
Round to the nearest ten					
Round to the nearest hundred					

1. What is the total number of schools in the five suburbs? Show your work.

2. One of her students noticed that if she added two of the numbers together, it was equivalent to the number of schools in the largest suburb. Which two suburbs did she use to solve the problem? Explain how you know.



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Holiday Helping Hands

Self Reflection: Write a reflection of your experience with this project. How did you feel about the math problems and activities? Explain what you found easy to do and any difficulties you had while working on this project. Did you enjoy this activity? Why or why not?

Rate this project.

Drag the checkmark to the statement you most agree with.

I am ready for something harder | It was just right | I found this challenging

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Holiday Helping Hands

Self Reflection Rubric: Drag the circle to one box per row on the rubric that expresses how you rate yourself on this Project Based Learning Activity.

I felt very confident about the math in this project.	I felt good about my ability to complete most of the math in this project.	I felt a lot of the math in this project was too hard for me to do alone.
I understood all the math and did not need help to complete the problems.	I understand most of the math but needed a little help to solve some of the problems.	I understood some of the math but needed help to complete most of the problems.
I easily used many strategies to solve the math problems efficiently.	I needed some help to use the best strategies for solving the math problems.	I had trouble understanding the best way to solve many of the math problems.
I feel I am ready for a harder math project.	I feel I would like to spend more time practicing similar math problems.	I feel I need assistance to work on similar math problems.

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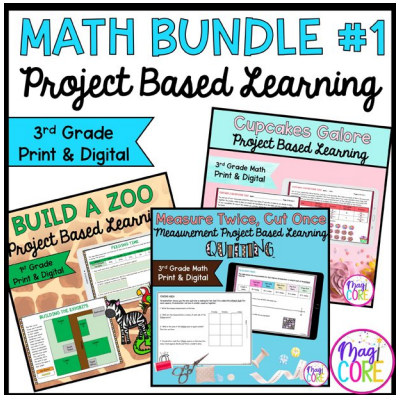

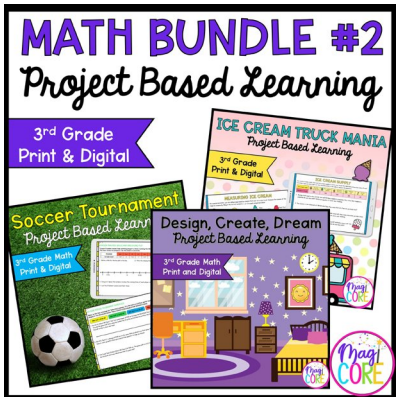

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