

HOLIDAY HELPING HANDS

Math Project Based Learning

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...

- Mr. Bradford bought a new roll of wrapping paper that is 12 feet long and 18 inches wide. He plans to precut the boxes? Draw a...

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...

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Lunar New Year

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

The Tree - 3

Mrs. Bradford and the girls will string popcorn and cranberries to use as garland for the Christmas tree. Help them make enough garland to put on the tree.

- Mrs. Bradford bought 12 feet of string. Ana and Kira each used 3 feet. It takes Mia one hour to string the garland. Show how you know.

Ana and Kira decide to use the garland to determine the number of...

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.

- Ariana drew a sketch of a placemat she wants to make. She wants it to look like a kinara. Help her calculate the many strips of each color she needs to make various quantities of placemats. Use your math in the table.

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 was pregnant before Jesus was born. Each night, families go to different homes and commemorate the long search for shelter by Mary and Joseph. They sing songs, pray, and eat traditional Mexican food. Children put on plays and dance.

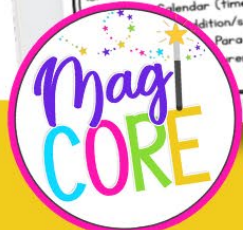
Holiday Helping Hands

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 challenging for me to do.
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.

2ND 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:

- 2.OA.A.1 Use addition and subtraction within 100 to solve one and two step problems.
- 2.OA.B.2 Fluently add and subtract within 20 using mental images.
- 2.NBT.A.2 Understand that the 3 digits of a 3-digit number represent amounts of 100s, 10s, and 1s. Count within 1000, skip-count by 5's, 10s and 100s.
- 2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- 2.NBT.B.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.
- 2.NBT.B.7 Add and subtract within 1000 using concrete models, drawings, and strategies; relate the strategy to a written method. Understand to add or subtract hundreds and hundreds, tens and tens, and ones and ones, and sometimes it is necessary to compose or decompose tens or ones.
- 2.NBT.B.8 Mentally add or subtract 10 or 100 to/from a given number from 100-900.
- 2.MD.A.3 Estimate lengths using inches, feet, centimeters, and meters.
- 2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units.
- 2.MD.B.6 Represent whole numbers as lengths from zero on a number line diagram.
- 2.MD.C.8 Solve word problems involving dollars, quarters, dimes, nickels, and pennies using symbols correctly.
- 2.GA.3 Partition circles/rectangles into 2, 3, and 4 equal shares; describe shares using the words halves, thirds, half of, a third of, etc. Recognize that equal shares do not need to have the same shape.

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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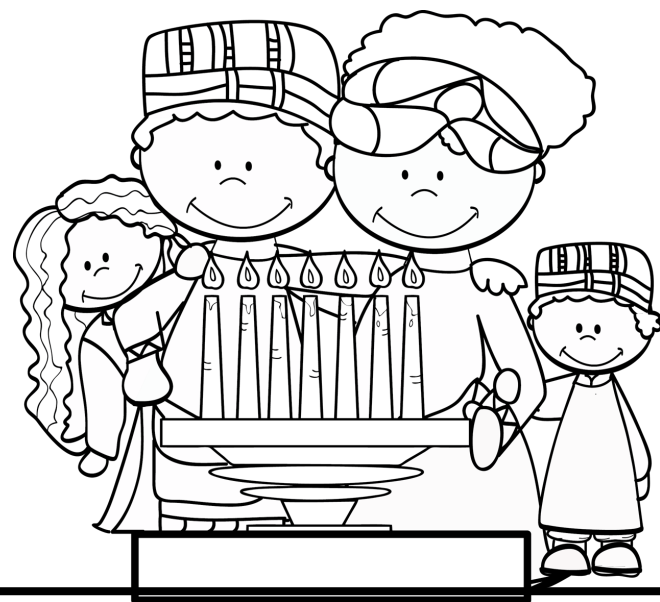
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Let's Get Ready for the Holidays!

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.



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.



Latkes - 1

The Abrams will make latkes each night of Hanukkah. The first six nights they will make 3 latkes each night. On the 7th and 8th nights, they will celebrate with relatives, so they will make more. The Abrams will make 6 latkes on the 7th night and 9 latkes on the 8th night. Use the table to answer the questions below.

Ingredients	3 latkes	6 latkes	9 latkes
potatoes	2	4	8
eggs	1	2	4
chopped onions	$\frac{1}{2}$ of an onion	1 whole onion	1 whole onion plus $\frac{1}{2}$ of one
flour	1 tablespoon	2 tablespoons	4 tablespoons
oil	1 cup	2 cups	4 cups

1. How many latkes will the Abrams make during the eight nights of Hannukah? Use the number line to show your answer.



2. How many potatoes will the Abrams need to buy to make enough latkes for the 8 nights of Hanukkah? Show with addition.
3. Naomi looks at the table and says she knows that they will need half the number of eggs as potatoes. Is she correct? How do you know?



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.

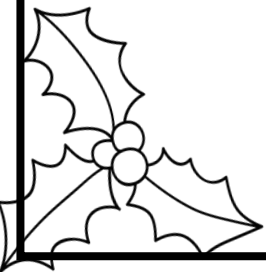
Let's meet the Bradford family. Mr. and Mrs. Bradford live in a small town in central Indiana with their daughters, Mia, who is 13, Ana, who is 10, and Kira, who is 7. They love celebrating Christmas with family and friends. You will be helping the Bradford family prepare for the busy Christmas holiday.



Caroling - 2

Every year the Bradford family goes caroling at a local hospital. They sing Christmas carols to patients who will not be home for Christmas. Help them plan their caroling trip this year.

4. How many minutes will it take for the Bradford family to sing in all three wings? Show how you know.
5. They begin singing in the first wing at 1:00 on Saturday afternoon. What time will they finish singing in the first wing? Show how you know.
6. Mia made a list of the 6 songs they will sing and thinks if they sing one song in each room of the hospital, they will sing each song five times. Is Mia correct? Show how you know.



Las Posadas

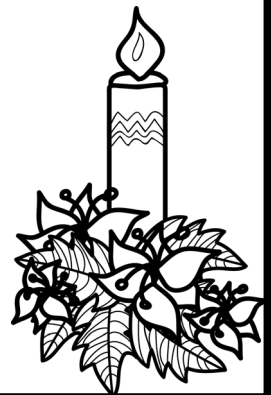
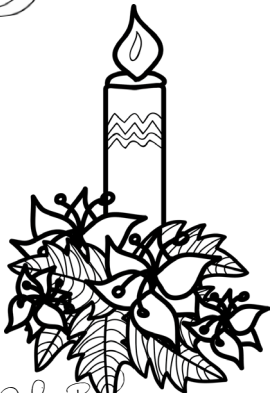
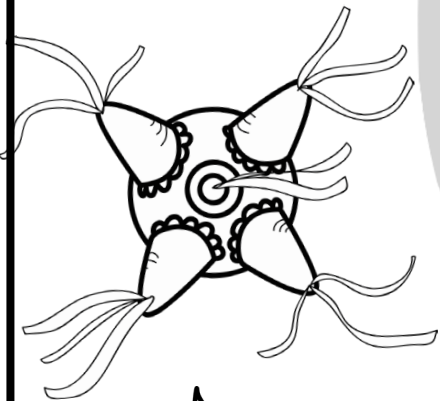
Las Posadas is an important Mexican tradition celebrated during the Christmas holidays. It lasts for nine nights, from December 16th through the 24th. The nine nights represent the nine months that Mary is pregnant before Jesus is born. Each night, families go to different homes and commemorate the long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

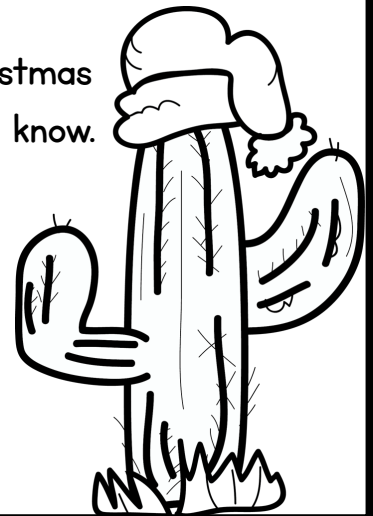
Let's meet the Garcia family. Mr. and Mrs. Garcia live with their three children in southern New Mexico. Pedro is 12, Luis is 9, and Maria is 6. Also living with the family is Abuela and Abuelo, or grandmother and grandfather. The family has deep faith and loves celebrating Las Posadas more than any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



Churros - 1

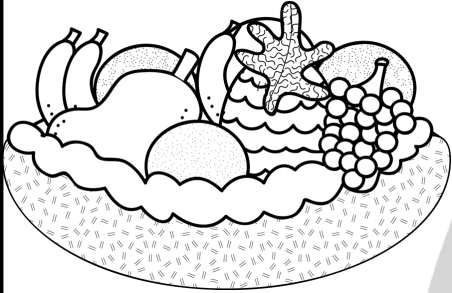
The Garcias are hosting the last night of Las Posadas. Mrs. Garcia and Abuela are known for making the best churros in the neighborhood. Churros are deep-fried pastries coated in cinnamon-sugar or chocolate. You will be helping the family make enough churros to feed the neighbors.

1. They need to make enough churros for 20 people to have three each. How many churros do Mrs. Garcia and Abuela need to make? Show how you know.
2. The recipe makes 15 churros. How many batches do they need to make in order to have enough for everyone to have three churros? Show how you know.
3. Abuela says it is always best to make an extra batch so that they can save a few for their Christmas celebration. What is the total number of churros they will make for Las Posadas? Show how you know.



Kwanzaa

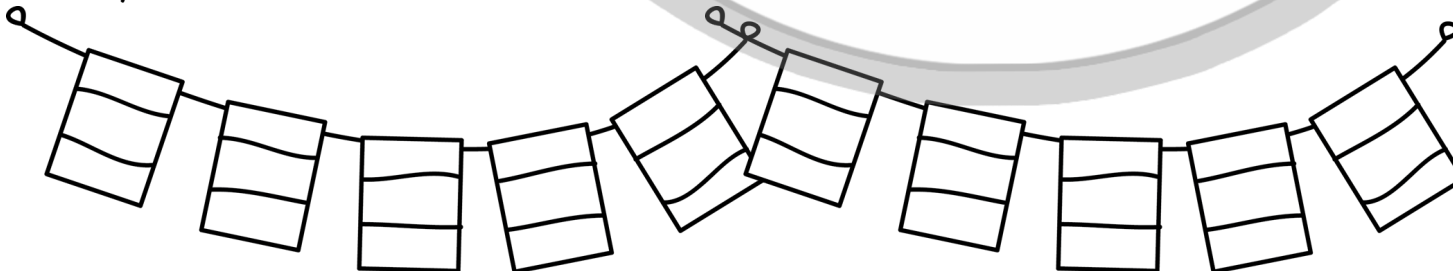
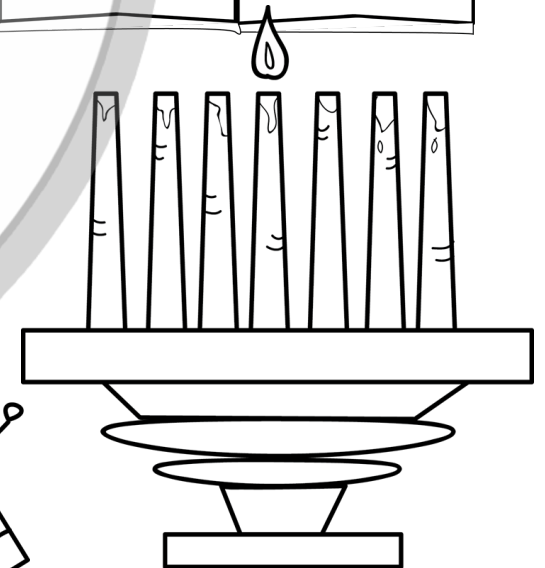
Kwanzaa is a celebration that honors African-American beliefs and traditions. It begins the day after Christmas and lasts until January 1st. After a week of celebrations, the holiday ends with a big feast and an exchanging of gifts.



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.

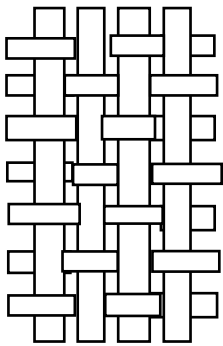
Kenisha and Monique Williams live in Atlanta, Georgia, with their adopted children, Arianna, age 8, and Cassie, age 9. They are proud to celebrate Kwanzaa with their friends and families. Your task is to help the family prepare for the holiday.



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. Show your math in the table.



STRIPS	One Placemat	Five Placemats	Ten Placemats
Green	3	$3 + 3 + 3 + 3 + 3 = 15$	$15 + 15 = 30$
Red	3		
Black	1		
Gold	4		

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. The first one is done for you.

	Strips for 10 placemats + Strips for 1 placemat = ?
Green	$30 + 3 = 33$ green strips
Red	
Black	
Gold	

Drumming

Kenisha and Monique bought ten small drums for guests to use at the feast. Cassie and Ariana practiced drumming games to play with their guests. Cassie started a drumming game called "Echo." First, she plays a pattern on the drum. Then, each person, one at a time, tries to repeat the pattern.

1. Here is Cassie's first pattern: **XX-X**. Each X represents one beat of the drum. If everyone in the drumming circle repeats the pattern correctly, how many beats will be played? Show how you know.
2. Ariana was the next to create a beat. Here is her pattern: **X-XX-XXX**. Kenisha is the 6th drummer in the circle. How many beats will be played after Kenisha has her turn? Draw a model to show your thinking.



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.



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. Ruby was born in the *Year of the Snake*. How many more years before she will celebrate the *Year of the Snake* for the first time since she was born? Show using subtraction.
2. Kevin was born in the *Year of the Dragon*. He will be thirteen years old when his family celebrates this new year. How many years ago did Kevin celebrate the *Year of Dragon* for the first time since he was born? 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. How old are Mr. and Mrs. Wei going to be this year? Circle your answer.

a. 39

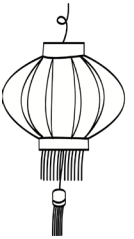
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d. 48

e. 41

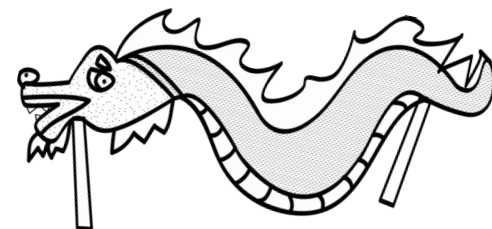
f. 42



New Year's Day Parade - 1

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.

1. Mrs. Wei wants to arrive downtown with enough time to park at her office and find a good spot for viewing the parade. It usually takes her 20 minutes to drive downtown for work. She wants to leave the house at 1:20 pm. What time will they arrive at the parking lot?
2. Mr. Wei thinks they should give themselves 15 minutes of extra time because he knows there will be a lot of traffic. What time does he think they should leave their house? Show how you know.
3. The walk from Mrs. Wei's office usually takes about 10 minutes to get to Main Street where the parade can be seen. If they arrived on Main Street at 1:35 pm, what time did they leave the parking lot and begin walking?



Challenge 2 * Parking Lot Measurement

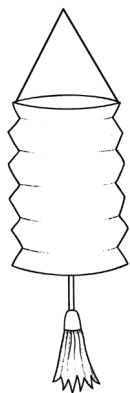
The Portland parking lot is in bad condition and needs repairs. The city plans to lay new asphalt. Help the city with the repairs.

- I. The city wants to lay new asphalt down in sections so that they can keep some of the lot open for people to use while the work is being done. Draw lines on each option below to divide them into four equal sections in two different ways.

Parking Lot Option 1



Parking Lot Options 2



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

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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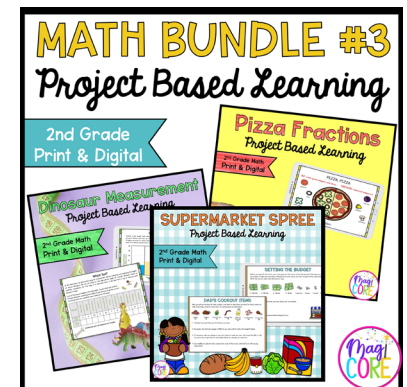
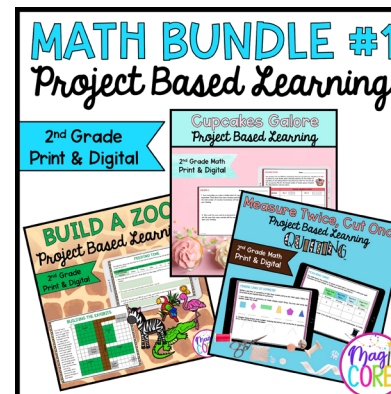


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