Great for Valentine’s Day!

Project-Based Learning

Kid in a Candy Store

High-Interest Project For Grades 4-5

Decimal Operations

Measurement with Fractions

Graphing ordered pairs

Fractions, decimals, and percentages

Common Core Aligned

5.G.1  5.G.2
5.NF.4  5.NF.5b
5.NBT.7

Real-life Math Skills

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Before Beginning
“It’sSugar” Candy Store: http://www.youtube.com/watch?v=XpS6WEQh9lc
This video is going to get kids PUMPED about this activity! It will give them some fun ideas and inspiration for their own projects and help them start asking questions about the topic.

Connections
• Technology: Use an app or computer program of your choice to design the candy store in 3D or 2D.
• Reading: Read about someone that started a business. My students like to read Bill Gates' biography!

Differentiation
• Try using a ½" scale for advanced learners.

Discussion Points
• What is the purpose of a checkout counter?
• What are some of the benefits of a large checkout counter? What about a small checkout counter?
• How will you utilize your checkout counter to help make more sales?
• How is a checkout counter related to customer satisfaction?

Process
Make sure you have yard sticks and rulers available for measurement! Model how to set up the coordinate grid on their graph paper, using the bottom left corner as “0”. Their paper should be landscape (see example). Take time to really explore measurements for the door and checkout counter. Discuss using the discussion points above. Facilitate student learning while they explore how to measure actual size and put it into a scale drawing.

Recommended Time: 60-90 minutes
Exploring Checkout Counters

Show students examples of checkout counters like this one. Have them brainstorm how they can estimate what their checkout counter will measure. They may want to measure a large table in class, or put several tables together to figure this out.
Part I: Build Your Candy Store

Driving Question: What mathematical skills are needed to plan and run a candy store?

Materials needed: ¼” Graph Paper, rulers, pencils, scissors, glue, yard sticks or measuring tape

Name your candy store:

_____________________________________

Graph the following points. Connect them to create the walls of your candy store.

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>26</td>
<td>30</td>
</tr>
</tbody>
</table>
Part I: Build Your Candy Store

1. Cut and paste your candy store onto construction paper under your candy store’s name.

2. Label the scale 1 square = 1 \( \text{ft}^2 \) on your graph paper.

3. Label the measurement of the length and width of your floor plan.

4. Find the total area of your store using the formula \( A = L \times W \). Write it under your graph paper.
Part 1: Build Your Candy Store

Label the door to enter your store. This is the symbol that architects use to show a door.

Ask Yourself: How much space does an open door take up? What tools do I need to measure this in my classroom?

Place a checkout counter in your store.

Ask Yourself: How much space does a checkout counter take? Are they all the same size? What tools do I need to measure this in my classroom?

Brainstorm the other items you will need to put in your store.

• ____________________________________________
• ____________________________________________
• ____________________________________________
• ____________________________________________
• ____________________________________________
• ____________________________________________
• ____________________________________________
• ____________________________________________
Part 2

Before Beginning
During part 2, students will be choosing the candy displays to place inside their store. This would be a great time to model how to graph on a one foot scale and how to graph fractional pieces. I like to begin with a mini lesson on length and width, the difference between feet in inches, and square feet. Once students understand that each side of the box measures one foot, it will be very easy for them to start placing their candy displays.

Connections
• Writing: Have students write a paragraph explaining why they chose certain types of candy for their store or a process essay explaining how they organized their candy displays.
• Reading: Continue reading about kids and adults starting businesses and make connections to our project.

Discussion Points
• How much room is needed between displays for people to walk?
• Why is it important to have a variety of candy for sale?
• Does it matter where each type of candy is placed? Will candy sell at different rates in different parts of the store?

Process
Have students take their time and really think about where they are putting each candy display. Walk around as they work and ask them about their placements. Have measurement tools out and encourage students to move desks and create aisles to see how much space will be needed between displays to allow for a comfortable walking path. Pair struggling students up with a buddy, and use partnerships to check each other’s work. I have my students draw everything in pencil first, and once it’s been checked for accuracy (and good flow!), I allow them to use colored pencils to label each display with a cute picture (See example below).

Recommended Time: 90-120 minutes
Candy Store Example
Part 2: Stock Your Candy

Choose one type of candy at a time. Use the “display dimensions” to graph the display in your store. Add as many different types of candy displays as you can fit in your store, but don’t forget to leave room for customers to walk! (Appendix B)

*display (verb): To show or exhibit*

<table>
<thead>
<tr>
<th>Candy Type</th>
<th>Display Dimensions</th>
<th>Cost for 1 Display</th>
<th>Amount in Each Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cookies &amp; Cream Chocolate Bar</td>
<td>width: 1 ft. length: 3 ½ ft.</td>
<td>$300</td>
<td>200 candy bars</td>
</tr>
</tbody>
</table>

Source: Turbosquid.com
Source: Regal-plastics.com
Source: thefabulousfarmhouse.typepad.com
## Part 2: Stock Your Candy

<table>
<thead>
<tr>
<th>Candy Type</th>
<th>Display Dimensions</th>
<th>Cost for 1 Display</th>
<th>Amount in Each Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chocolate Candy Bar</td>
<td>width: 1 ½ ft.</td>
<td>$120</td>
<td>300 candy bars</td>
</tr>
<tr>
<td></td>
<td>length: 4 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard Candy</td>
<td>width: 1 ft.</td>
<td>$25</td>
<td>500 pieces</td>
</tr>
<tr>
<td></td>
<td>length: 2 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ring Pop</td>
<td>width: 1 ft.</td>
<td>$30</td>
<td>50 pieces</td>
</tr>
<tr>
<td></td>
<td>length: 2 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft Candy</td>
<td>width: 6 ft.</td>
<td>$100</td>
<td>100 bags</td>
</tr>
<tr>
<td></td>
<td>length: 4 ft.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Part 2: Stock Your Candy

<table>
<thead>
<tr>
<th>Candy Type</th>
<th>Display Dimensions</th>
<th>Cost for 1 Display</th>
<th>Amount in Each Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gummy Bears</td>
<td>width: 1 ft.</td>
<td>$100</td>
<td>50 small bags</td>
</tr>
<tr>
<td></td>
<td>length: 3 ½ ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rock Candy</td>
<td>width: 2 ft.</td>
<td>$90</td>
<td>30 large rock candy</td>
</tr>
<tr>
<td></td>
<td>length: 4 ½ ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jelly Beans</td>
<td>width: 2 ft.</td>
<td>$75</td>
<td>60 medium bags</td>
</tr>
<tr>
<td></td>
<td>length: 3 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton Candy</td>
<td>width: 6 ½ ft.</td>
<td>$200</td>
<td>100 bags</td>
</tr>
<tr>
<td></td>
<td>length: 1 ft.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part 3

Before Beginning
Students will need to know what the word profit means before beginning this part. I highly recommend using the discussion points before you begin! Students will use division & subtraction, so you may want to do a quick pre-assessment to see which kids may struggle with these skills. Use problems similar to the ones they’ll be doing during this part of the project.

Connections
• Social Studies: This is a great time to incorporate any economics standards you may have. You can bring in S.S. mini-lessons about income, revenue, profit, loss, goods, trade, and much more!
• Art in Real Life: Design what the pricing signs will look like in the store. Look at examples of signs in stores (online photos or bring in photos) and how they use them to sell their products.

Discussion Points
• How much profit is enough to cover other expenses such as employees, rent, and electricity?
• How much would you be willing to spend on each candy? Would you still buy it if it were priced above this amount?
• Why is correct pricing so important for your business?
• What would happen if your friend’s candy store nearby sold their candy for a lower price?
• Is there any other way that stores can provide value to their customers other than just selling them something? (Compare customer service at a more expensive store to one at a discount store.)

Process
There may only be 1 piece of paper used during this part of the activity, but it is not a simple task! Students really have to attend to precision (mathematical practice 6) because some of these items will be purchased individually and others will be purchased as a bag. Make sure that you group students in a way that they can talk to each other about what math they will need to use to find the profit for each type of candy. This discussion is so important. Make sure that students don’t treat this as a race to finish filling out the table. Stop every so often to ask questions and facilitate discussion.

Recommended Time: 45-60 minutes
Part 3: Make Money!

Stores buy items like candy, then sell them for more money to their customers. This is how they make **profit**.

1. Calculate the cost of each item on your display to decide how much you are paying for each.
2. Decide how much you are going to sell it for, and how much profit you will make.
3. Be careful not to overcharge, or people won’t buy your candy.

<table>
<thead>
<tr>
<th>Candy Type</th>
<th>Cost for 1 Display</th>
<th>Amount in Each Display</th>
<th>Cost for each piece or bag</th>
<th>Price at my store (Your choice!)</th>
<th>Profit for each piece or bag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cookies &amp; Cream</td>
<td>$300</td>
<td>200 bars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chocolate Candy Bar</td>
<td>$120</td>
<td>300 bars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard Candy</td>
<td>$25</td>
<td>500 pieces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ring Pop</td>
<td>$30</td>
<td>50 pieces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft Candy</td>
<td>$100</td>
<td>100 bags</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gummy Bears</td>
<td>$100</td>
<td>50 bags</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rock Candy</td>
<td>$90</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jelly Beans</td>
<td>$75</td>
<td>60 bags</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton Candy</td>
<td>$200</td>
<td>100 bags</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Before Beginning
This part isn’t required, but is an extension of the learning. If you have students that are advanced learners, or are completing this project at the end of 5th grade and want to practice a few of next year’s standards (Common Core), do this part! Students will convert between fractions, decimals, and percentages. I usually do a full lesson on these that incorporates their candy store project and teaches them these skills.

Connections
• Technology: Use an app or computer program of your choice to create a graph to display the data.
• Reading: Read about the importance of using statistics to make decisions. My favorite book for this is The Cartoon Introduction to Statistics by Grady Klein. The First section on the basics is great! Many of my kids also liked Sports Illustrated Kid Stats (2013).
• Hands on learning: Bring in candy & baggies for students to count and create their fractions, decimals, and percentages.

Discussion Points
• What is a statistic? How do we use statistics in business?
• Why is it important to represent data as a percentage?
• How can stores make more money by offering a “grab bag”?
• Will a mystery grab bag sell more or less than one that’s you can see the contents of?

Process
Like I said above, I use this as a teaching tool for a standard that isn’t taught during 5th grade any longer if you’re a Common Core state. It is a great introduction to converting between fractions, decimals, and percentages! We start from benchmark fractions, decimals, and percentages during this lesson because many students already recognize that .25 equals ¼ which equals 25%. Feel free to forgo this part if you don’t think it will appropriate for your classroom.

Recommended Time: 30-45 minutes (for student work)
Part 4: Candy Statistics

Count how many displays you have in your candy store.

I have __________ displays.

Create a fraction for how many of your displays fit into each category:

<table>
<thead>
<tr>
<th>Type of Candy</th>
<th>Number of Candy Displays</th>
<th>Fraction</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chocolate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard Candy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chewy Candy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Candy</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List the type of candy from least to greatest amount in your store.

_________________________________________________
Part 5: Grab Bags

Kids love buying candy grab bags because it’s a surprise what candy they will find inside. The best thing about grab bags is that there is a mix of different candy inside. Grab bags can make you a lot of money in your candy store.

Choose 3 types of candy from your candy store. Fill out the following table to show what candy you will include in your grab bag. You will need 20 pieces total.

<table>
<thead>
<tr>
<th>Type of Candy</th>
<th>Fraction</th>
<th>Ratio</th>
<th>Decimal</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
By the end of this project, students should show that they have a good working knowledge of economics vocabulary such as income and profit. They should also be able to explain the math concepts used.

Decide how you'd like students to show mastery for this project. I like to have mine create a portfolio where they explain each step they took to complete the project and how they know their math is accurate. All of the filled-in student pages are included in their portfolio next to the corresponding reasoning and proof page. They create an advertisement for their candy store (poster, video, etc.), where they include pricing, sales, and any other reasons why people should visit THEIR candy store. I grade them based on completion, accuracy, neatness, and creativity (out of 5 points each). There are so many ways you can end this project to fit your students' interests and skills!
The best things about project-based learning is the opportunity to extend an activity across subject areas!

More Math/Advanced Learners:
Find the area of each of your candy displays. Create a table to display the data. Next, find the total area of candy displays in your entire store.

Reading:
Check out a book about starting a business or money concepts. Choose one on a topic you are interested in. Read it closely and write a summary of important points to share with your friends.

There are so many topics within this project to read about in class. Check out your local library for some great books to make available in your classroom library, or give students the task of finding their own. You can teach about a lot of ELA standards using texts related to this topic. *The Totally Awesome Business Book For Kids* is my personal favorite! I have a digital copy that I screenshot and airdrop to my student devices. There are many other ways to share just one copy!

Economics/Social Studies
The following website has SO many resources to extend your economics lesson. Check some of these out and match them with your social studies standards.


Science
There are so many ways the topic of candy can be used for science. On Pinterest you can find a TON of candy experiments! The following article is an interesting read if you’re looking at candy from a scientific perspective:
http://theweek.com/articles/442570/sugary-secrets-candymaking-chemistry
Find More Great Activities & Ideas!

https://www.teacherspayteachers.com/Store/Performing-In-Education

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