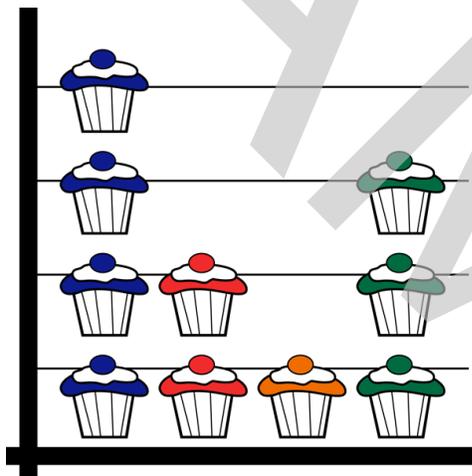


TECHNO**Sales**

Teacher Guide

Lessons for Elementary School Students



Technology Project using

Excel & Word 365

Organize a bake sale using spreadsheets.

In this project, students plan a bake sale to raise money. This task requires them to investigate food preferences and analyze financial data to make decisions about the fundraiser. Findings are organized into a report with graphs, to show why their decisions will make the bake sale a success.

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TechnoSales Overview

Introduction to TechnoSales

In this project, students plan a bake sale to raise money. This task requires them to investigate food preferences and analyze financial data to make decisions about the fundraiser. Findings are organized into a report with graphs, to show why their decisions will make the bake sale a success.

Students complete the following tasks:

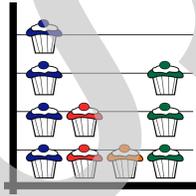
- In session 1, students are introduced to Microsoft Excel and spreadsheet terminology. To learn about the program, students play "You Found my X-Cell". This game has students identify cell references, navigate in a worksheet, enter data, fill cells with color, format the appearance of text, change the alignment, apply borderlines, and select multiple cells. It is a fun way to learn essential spreadsheet skills.
- In session 2, students learn how to use Microsoft Excel to make decisions about their upcoming bake sale. To make this fundraiser a success it is essential that the dessert sold is a popular item. To answer the question "What desserts do students prefer?" students conduct a survey. The results are organized into a worksheet and then placed into a column graph. The data is then analyzed to determine the dessert item that students prefer. Will it be cupcakes, muffins, or cookies?
- In session 3, students continue to analyze the results of the Dessert Preference Survey. To answer the question, "Are there differences between desserts girls and boys prefer?" a double column graph is used to compare the types of desserts both like to eat. This graph will help students to select a bake sale item that everyone will enjoy. By studying the graph, they will be able to make a decision that will ensure success.
- In session 4, students must decide the flavors of dessert to have at the bake sale. This information is important because there needs to be plenty of items that people like. To answer the question, "What Flavor of Dessert do Students Like?" they conduct another survey. The results are organized into a worksheet and then placed into a pie graph. The data is then analyzed to determine the flavor students should sell. Will it be chocolate, vanilla, or strawberry?
- In session 5, students calculate the number of desserts required for the sale. This information is important because there must be enough items to sell to raise a certain amount of money. To answer the question, "How Many Dessert Items Do You Need?" past sales are studied. The sales information is organized into a worksheet and placed into a line graph. The data is then analyzed to estimate the average money earned in previous sales. This information is used to set a financial goal. Afterwards, formulas are created to calculate a fair price, amount of baked goods needed, and the number of items each student needs to bake. By using math to collect information, students can make good decisions that are sure to make the bake sale a success!
- In session 6, students produce a report about how to make the bake sale a success. Using Microsoft Word, they explain their decisions about the sale. They describe the purpose of the sale, the item to be sold, financial goal, price of each item, total number of baked goods needed, and the amount each student in the class will need to bring to the sale. Afterwards, the report is edited to correct spelling and grammar errors. Upon completion, it is sent to the printer for publication.

Implementation and Technology Integration Ideas

Have your students learn data analysis techniques and spreadsheet skills in a fun, meaningful way. In TechnoSales, students plan a bake sale as a fundraiser. This project is based on a problem-solving model, with each session targeting a series of questions or problems to solve. The activities connect mathematics to a real-world situation that is simplified to make it understandable to children. This project can be used to develop critical thinking, teach inquiry and analytic research methods, and build problem solving strategies. There are several ways to integrate TechnoSales into curriculum:

TechnoSales integrates into varied areas of the curriculum:

- *Mathematics Problem Solving Unit:* Include TechnoSales as part of your mathematics curriculum. Engage your students in a problem that they would like to solve – planning a successful bake sale. The activities in TechnoSales use a problem-solving model. Students gain an understanding of the problem, investigate the issue, analyze the findings, and recommend a solution based on the evidence. Throughout the project, various strategies for formulating a decision are applied to guide students through decision making.
- *Mathematics Graphing Unit:* Teach graphing techniques in a meaningful way. TechnoSales includes activities for displaying data in a single and double bar graph, pie graph, and line graph. By interpreting the graphs students make decisions based on real world data that they collected. Extension activities have students transform the data visually by altering the chart type, changing each data point to a picture, and rearranging a pie graph.
- *Digital Literacy Class:* TechnoSales can be included as part of a computer course or class. Students learn spreadsheet skills such as how to manage sheets, format cells, calculate data, and graph cell ranges. Extension activities develop advanced graphing skills and a deeper understanding of formulas.
- *Computer Science Course:* Include TechnoSales as part of a Computer Science course. The activities target data and analysis concepts. Students collect, organize, and present survey results and sales information visually using tables and graphs. Spreadsheet skills are applied to analyze data points and series. The findings are used to predict earnings, develop a viable plan, and justify recommendations in a report.
- *Financial Literacy Unit:* Provide an opportunity to learn about money. The scenario of a bake sale allows students to investigate practical solutions to a realistic problem. Instead of a teacher-directed approach, have students become actively involved in raising funds for school events or equipment. Together, they can develop realistic financial goals and a plan for a successful fundraiser.



Session 2

What Desserts Do Students Prefer?

In this session, students learn how to use Microsoft Excel to make decisions about their upcoming bake sale. To make this fundraiser a success it is essential that the dessert sold is a popular item. To answer the question "What desserts do students prefer?" students conduct a survey. The results are organized into a worksheet and then placed into a column graph. The data is then analyzed to determine the dessert item that students prefer. Will it be cupcakes, muffins, or cookies?

Assignment 4: Introduction to Bake Sale Fundraiser

Assignment 5: Dessert Preference Survey

Assignment 6: Organize Dessert Survey Results

Assignment 7: Graph Results of Dessert Preference Survey

Session 2 Review: Popular Excel Commands

Session 2 Skill Review: Ice Cream Cart

Session 2 Extension Activity: Add Pictures into a Bar Graph

Assignment 4 Introduction to Bake Sale Fundraiser

A bake sale is a fundraising activity where baked goods such as cookies, pies, and cakes are sold to raise money for a specific purpose.

Plan a real or imaginary bake sale.



Fundraising Ideas

school trip	library books	gym equipment
team uniform	music instruments	computer devices
playground	garden	graduation ceremony

About the Fundraiser

1. What is a fundraiser?

An event or function that is held to raise money for a specific purpose.

2. For what purpose are you raising money?

3. Why do you think a bake sale will help you raise money?

4. How can Microsoft Excel help you plan your bake sale?

Assignment 5 Dessert Preference Survey

To have a bake sale you must decide what baked goods to sell. Survey your classmates to find out the type of dessert they would buy at a bake sale.

The results of the survey will be put into a Microsoft Excel spreadsheet. The information will be used later to create a bar graph that will help analyze the results to reach a decision.

How to Conduct a Survey

1. **Pick Bake Sale Items:** To begin the survey, as a class, suggest to your teacher four or five desserts you would buy at a bake sale. Write the list of items into the table below.
2. **Conduct a Class Survey:** Ask how many **girls** would like to buy the first item in the list. Record the number of responses in the *Girls* column beside the item in the table. Then ask how many **boys** would buy the same item. Record the number of responses in the *Boys* column. Repeat for the remaining items in the list.

Each person can only vote ONCE!

3. **Calculate the Totals:** When complete, calculate the results of each item by adding the totals together and recording each amount in the *Total* column.

Record the Survey Results

DESSERT	NUMBER OF GIRLS	NUMBER OF BOYS	TOTAL

You will compare boys and girls survey data in an upcoming assignment.



Answer Questions About the Survey Results

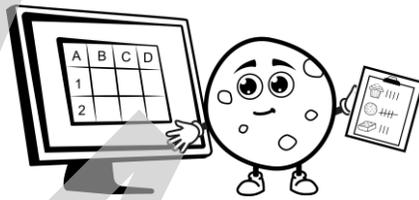
1. What dessert is liked the most?

2. What dessert is liked the least?

Assignment 6 Organize Dessert Survey Results

Organize your survey results using Microsoft Excel. Follow the instructions to:

- Add a title and center it within a group of cells.
- Record the survey results.
- Use AutoSum to quickly calculate totals.
- Use the AutoFill feature to copy a formula into cells.
- Format the cells to make the information easy to read.
- Rename the worksheet *Dessert Survey*.
- Save the workbook as *bake sale*.



Open Excel 365

1. ▷ Open Excel 365. 
▷ Click *Blank workbook*.

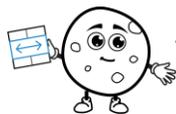


Add the Title "Dessert Preference Survey" and Then Make It Look Great

2. a. Add a title:
▷ In **A1**, type **Dessert Preference Survey**.

	A	B	C
1	Dessert Preference Survey		
2			

- ▷ Press ENTER.



The title covers more than three cells. You can use Merge and Center to combine cells to make the information fit better. Try it!

- b. Merge and center the title:
▷ Click and drag to select the cells – **A1**, **B1**, **C1**, and **D1**.
▷ In the Home tab, find the Alignment group and click *Merge and Center*. 

c. Format the text:

▷ Select the title.

▷ Make the title look great using these commands:

Calibri

Font

B Bold

U Underline

11

Font Size

I Italic

Font Color

Record the Survey Results in Microsoft Excel

3. a. Add headings:

▷ In **A3**, type **Dessert**.

▷ Press **TAB** to move to cell **B3**. Type **Girls**.

▷ Move to cell **C3**, type **Boys**.

▷ Move to cell **D3**, type **Total**.

3	Dessert	Girls	Boys	Total
---	---------	-------	------	-------

▷ Press **ENTER**.



Now take your survey results and type them into the worksheet.

b. Enter survey items:

▷ In **A4**, type the **first dessert** from your survey list. Press **ENTER**.

▷ Type the **next dessert** from your survey list.

▷ Repeat until each dessert has been added.

If the text is too wide for the cell, double click in between the column headings. This will fit the cell to the text.



c. Enter *Girls* results:

▷ In **B4**, type the **number of girls** who preferred the first dessert. Press **ENTER**.

▷ For each dessert, type the number of girls in the correct cell.
 If there is no value, type **0**.

d. Enter *Boys* results:

▷ In **C4**, type the **number of boys** who preferred the first dessert. Press **ENTER**.

▷ For each dessert, type the number of boys in the correct cell.
 If there is no value, type **0**.

Total Results for Girls and Boys Using AutoSum

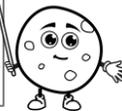
4. a. Use AutoSum to create a formula:

▷ Select **D4**.

▷ In the Home tab, find the Editing group and click *AutoSum*. Σ Press ENTER.

	A	B	C	D
1	Dessert Preference Survey			
2				
3	Dessert	Girls	Boys	Total
4	muffins	0	0	=SUM(B4:C4)
5	cookies	4	6	

Excel automatically selects the two adjacent cells and inserts a formula that adds the values from the Girls and Boys columns.



- b. Study the formula:

▷ Select **D4**.

▷ Look in the Formula Bar to see the formula:

=SUM(B4:C4)

All calculations begin with the = sign. It tells the program that there is a formula in the cell.

SUM is used for addition. It tells the program to add the values in the cells together.

(B4:C4) is the cell range. A colon : goes between the start and end cell. Brackets () go around the cells to be summed.

Use AutoFill to Calculate Remaining Totals

AutoFill completes a series by copying information into a cell. It automatically changes the cell references.

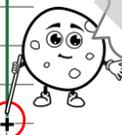
5. a. Use AutoFill to copy the formula into the cells below:

▷ Select **D4**.

▷ Drag the AutoFill handle down to calculate the dessert *Totals*. $+$

3	Dessert	Girls	Boys	Total
4	muffins	0	0	0
5	cookies	4	6	
6	brownies	8	2	
7	cupcakes	2	2	

When you let go, the *Totals* will show in the cells.



- b. What is the formula in each *Total* cell? Select the cell and then look in the Formula Bar:

=SUM(B4:C4)

=SUM(B5:C5)

=SUM(B6:C6)

=SUM(B7:C7)

Format the Cells to Make the Data Easy to Understand

6. a. Apply formatting to make the cells look like a table:

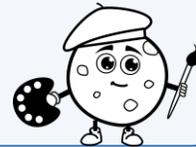
- ▷ Fill the headings with color. 
- ▷ Center the column headings. 
- ▷ Apply borderlines to outline the cells. 

b. Apply your knowledge to make the data look great:

Calibri Font **B** Bold  Fill Color
11 Font Size  Font Color  Center

Hints and Tips:

- Pick a font that is easy to read. Calibri
- Make the headings a larger font size. 14
- Center the values in the cells. 



Rename the Worksheet

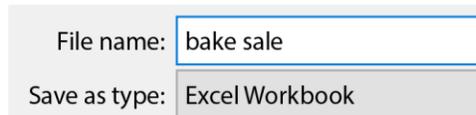
You will be adding more information to this workbook. Since it will have more than one worksheet, it is a good idea to rename the sheet tab.

7. ▷ Right click on the *Sheet1* tab and select *Rename*.
 ▷ Type **Dessert Survey** and press ENTER.



Save the Workbook

8. ▷ Click Save on the Quick Access Toolbar. 
- ▷ Go to the place where you save your work.
 - ▷ Name the file **bake sale**.



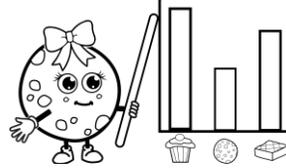
- ▷ Click Save.

Close Excel 365

Assignment 7 Graph Results of Dessert Preference Survey

In this assignment, you graph the survey results. A graph is a picture of information. A column graph uses vertical bars to show numbers. The taller the bar the higher the number. The shorter the bar the lower the number.

When you graph your survey results, it will be easy to see how many people like a dessert. The dessert liked the most will be the tallest bar and the dessert liked the least will be the shortest bar.



Questions About Graphing

1. What is a bar graph?

A graph that uses a bar to represent a number.

2. Why would you want to use a graph?

It quickly summarizes data by turning it into a picture.

3. What bar would be higher? The bar that represents the number 3 or the bar that represents the number 7?

A bar that represents the number 7.

Open the Bake Sale Workbook in Excel 365

1. ▷ Go to the place where you save your work.
▷ Open the *bake sale* file.

Select the Data to Graph

To make each bar in the graph show the number of people who liked the dessert, you need to select the cells with the dessert names and the total number for each dessert.

2. a. Select the *Dessert* names in Column A:
▷ Click the first dessert item. **(A4)**
▷ Click and drag down to select all the desserts. 

	Dessert	Girls	Boys	Total
3				
4	muffins	0	0	0
5	cookies			
6	brownies			
7	cupcakes		2	4

Select the dessert names.

b. Select the *Totals* for each dessert:

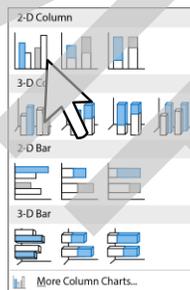
- ▷ Press and HOLD the CTRL key. **Ctrl**
- ▷ Click the first number in the *Total* column. **(D4)**
- ▷ Click and drag down to select all the totals. **+**

	A	B	C	D
1	Dessert Preference Survey			
2				
3	Dessert	Girls	Boys	Total
4	muffins	0	0	0
5	cookies	4	6	10
6	brownies	8	2	10
7	cupcakes	2	2	4

Both the dessert names and totals should be selected.

Insert a Column Chart

3. ▷ Click the Insert tab.
- ▷ In the Charts group, choose *Insert Column or Bar Chart*.
- ▷ Select *Clustered Column*.



▷ Notice that the Chart Design tab is now active.

A chart appears on the worksheet and Chart Tools are now active on the ribbon.

Choose the Chart Layout

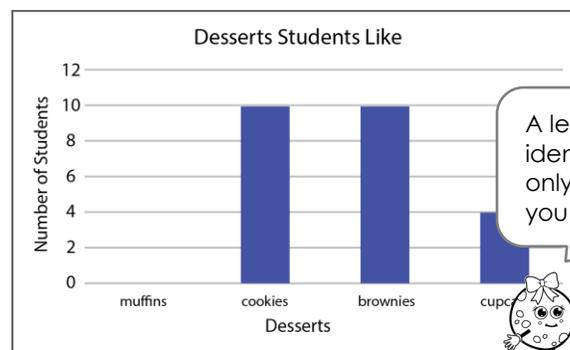
4.
 - ▷ Click the Chart Design tab.
 - ▷ In the Chart Layouts group, click *Quick Layout*.
 - ▷ Rest the pointer over each layout to display the name. Select *Layout 9*.



There are many layouts. Layout 9 makes the information easy to understand.

Label the Graph and Delete the Legend

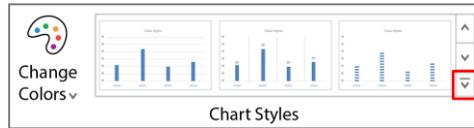
5.
 - a. Add a chart title:
 - ▷ Select the *Chart Title*.
 - ▷ Triple click inside the box to select the text.
 - ▷ Type the title **Desserts Students Like**.
 - b. Add the X axis label:
 - ▷ Select the *Axis Title* on the X axis. (It has dessert names above it.)
 - ▷ Triple click inside the box to select the text. Type **Desserts**.
 - c. Add the Y axis label:
 - ▷ Select the *Axis Title* on the Y axis. (It has numbers beside it.)
 - ▷ Triple click inside the box to select the text. Type **Number of Students**.
 - d. Select the legend box. Press the DELETE key to remove it.



A legend color codes data to identify data series. This chart only has one series – *Total* – so you do not need a legend.

Choose the Chart Style

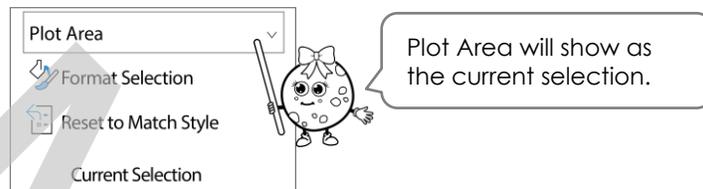
6. ▷ Click the Chart Design tab.
- ▷ In the Chart Styles group, click the More arrow. ▾



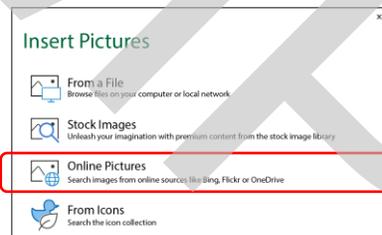
- ▷ Choose a style.

Add a Picture to the Plot Area

7. ▷ Select the *Plot Area*. (The area behind the bars)

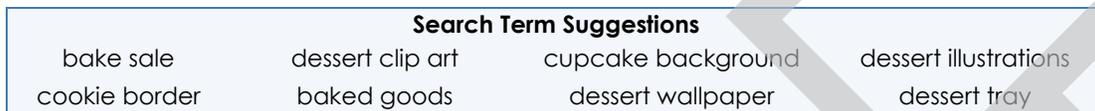


- ▷ Click the Format tab. In the Shape Styles group, click *Shape Fill*.
- ▷ Choose *Picture*.
- ▷ Select *Online Pictures*.

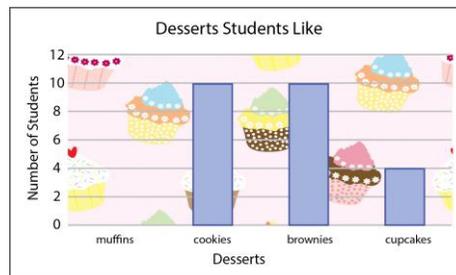


- ▷ In the Search box, type **bake**. Press ENTER.

bake



- ▷ Double click on a picture you like.



TIP: Make Picture Lighter:

- From the Format tab click *Format Selection*.
- Select *Fill & Line*. Click **FILL**.
- Drag the *Transparency* slider to the right.

Transparency 10%

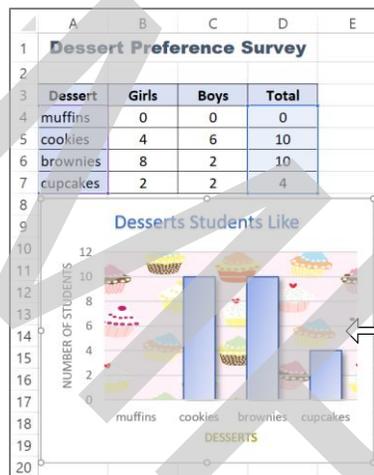
Format the Parts of the Graph

8. Explore the Chart Tools to format the graph:

-  Can you fill the bars with a color, gradient, or texture?
-  Can you change the color and weight of the outline around the bars?
-  Can you add a shadow, glow, or bevel to the bars?
-  Can you apply a WordArt Style to the chart title?
-  Can you adjust the color, outline, or effects applied to the X axis title?

Position and Resize the Graph on the Worksheet

9. ▷ Move the chart below the survey data. 
- ▷ Drag the handles to change the size of the chart. 



Analyze the Graph

10. Have a look at the results in the graph. What do they mean?

a. What dessert was liked the most?

b. What dessert was liked the least?

Save the Changes and Close Excel 365

11. ▷ Click Save on the Quick Access Toolbar. 

▷ Close Microsoft Excel. 

Session 2 Review: Popular Excel Commands

Match the command to its name.

1. **C** AutoSum

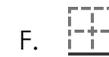
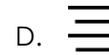
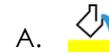
2. **A** Fill Color

3. **E** Merge and Center

4. **B** Bold

5. **F** Borders

6. **D** Center



/6

Which will do the job? Pick the correct command.

				
Thick Outside Borders	Shape Outline	Quick Layout	Align Left	Insert Column or Bar Chart

7. You want to make a graph.

Insert Column or Bar Chart

8. You want to apply a layout to a chart to set the chart titles and labels.

Quick Layout

9. You want to apply a thick outline around a cell.

Thick Outside Borders

/3

Select the correct choice.

10. What action is being done to the cells? 

a. Increase the row height.

b. Increase the column width.

c. Delete the contents of the cell in column A and B.

/1

TOTAL: /10

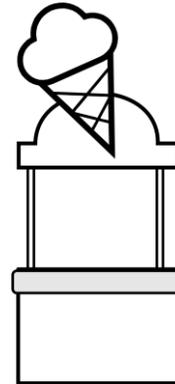
Session 2 Skill Review: Ice Cream Chart

You are the proud new owner of an ice cream cart. To help decide what flavors to have in the cart, you surveyed adults and children to find out what they liked.

What flavors of ice cream should you have in the cart?

Use Microsoft Excel to organize the survey results and graph the data.

SURVEY RESULTS			
Ice Cream Flavor	Adults	Children	Total
vanilla	19	3	
bubble gum	0	8	
butter pecan	12	3	
cookies and cream	3	6	
chocolate	6	12	
mint chocolate chip	3	2	
strawberry	10	4	



- Open Microsoft Excel. Click *Blank workbook*.
- Add a title:
 - In **A1** type **Ice Cream Survey**. Press ENTER.
 - Select cells **A1**, **B1**, **C1**, and **D1**.
 - Click *Merge and Center* to combine the cells.
 - Change the font size to **12**.
 - Apply the *Bold* style. **B**

- Type the survey headings into each cell:

A3 Flavors	B3 Adults	C3 Children	D3 Total
-------------------	------------------	--------------------	-----------------

- Type each **Ice Cream Flavor** into a cell below the *Flavors* heading. Refer to the table above.

If the text is too wide for the cell, double click in between the column headings. This will fit the cell to the text.



A + B

- Type the **number** of *Adults* and *Children* that like the flavor. Refer to the table above.
- Calculate the *Totals*:
 - Use *AutoSum* to calculate the number of people that like the flavor. Σ
 - Use *AutoFill* to copy the formula into the remaining cells in the *Total* column. **+**

- Make the data look great. **B**

8. Make a column graph of the total number of people that like each flavor.
 - a. Select the Flavors (**A4:A10**) and Totals (**D4:D10**) using the CTRL key.
 - b. From the Insert tab, click *Insert Column or Bar Chart*. 
 - c. Select *Clustered Column*.

9. Click Quick Layout. Select *Layout 9*. 

10. Label the chart:

- a. Type the *Chart Title*, **Ice Cream Flavors People Like**.
- b. Type the *X axis Title*, **Ice Cream Flavors**.
- c. Type the *Y axis Title*, **Number of People**.
- d. Remove the legend.



If you have time, use your skills to make the graph look great!



11. Resize  and move  the graph below the survey data.
12. Save the document as **Ice Cream Survey**.

Questions about the Survey Results

Analyze the data and the graph to answer the questions.

1. Look at the data. What flavor of ice cream do adults like the most? vanilla
2. Look at the data. What flavor of ice cream do children like the most? chocolate
3. Look at the data. What flavor of ice cream do adults like least? bubble gum
4. Look at the data. What flavor of ice cream do children like least? mint chocolate chip
5. Look at the graph. What flavor is liked the most? vanilla
6. Look at the graph. What flavor is liked the least? mint chocolate chip
7. If you can fit only five flavors into your cart, what ones will you choose?

<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

Why did you choose these flavors?

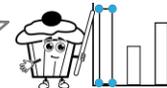
Session 2 Extension Activity: Add Pictures into a Bar Graph

Fill each bar with a stack of the dessert.

For example, if three people liked cookies, you can stack a picture of three cookies inside the bar. This will make your graph even EASIER to understand. Try it!

1. Open the Excel workbook that has the Dessert Survey graph you created in Assignment 7.
2. Select the first bar:
 - a. Click on the first bar once to select ALL the bars in the data series.
 - b. Click again to select ONLY the bar or data point.

TIP: There should be handles around ONE bar, not all the bars.

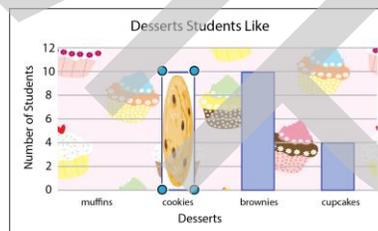


3. Insert a picture of the dessert into the bar:
 - a. Click the Format tab. In the Shape Styles group, click *Shape Fill*.
 - b. Choose *Picture*.
 - c. Select *Online Pictures*.
 - d. In the Search box, type **dessert name clip art**. Press ENTER.

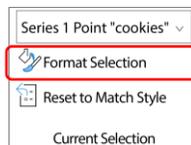


TIP: Look for a picture that is only ONE item!

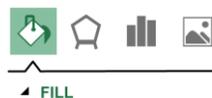
- e. Double click on a picture you like.



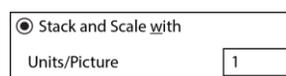
4. Stack the picture:
 - a. Click the Format tab. In the Current Selection group, click *Format Selection*.



- b. In the Format Data Point pane, select *Fill & Line*. Click FILL.



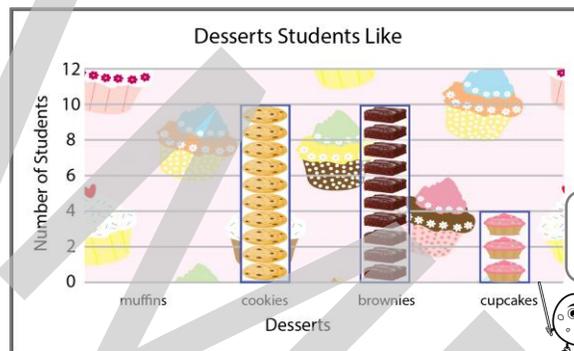
- c. Select *Stack and Scale with* and set the Units/Picture to 1.



Each "like" is now a picture.



5. Insert a picture of the dessert item into each remaining bar. Follow these steps:
 - a. Select each remaining bar or data point.
 - b. From the Format tab, click *Shape Fill*. 
 - c. Choose *Picture*. 
 - d. Select *Online Pictures*. 
 - e. Search for the **dessert name clip art**. Insert a picture of ONE item.
 - f. Stack the picture:
 - o From the Format tab, click *Format Selection*. 
 - o In the Format Data Point pane, select *Fill & Line*. Click **FILL**. 
 - o Select *Stack and Scale with* and set the Units/Picture to **1**.



Simple images often look better.

6. Optional: Make a copy of your work:
 - a. Click the File tab. Select *Save As*.
 - b. Go to the place where you save your work.
 - c. Save the file as **picture in graph**.
7. Close Microsoft Excel.

Bake Sale Marking Sheet

Report Content and Design	
<p>The purpose of the bake sale fundraiser is clearly explained.</p> <p>Information in the report makes sense.</p> <p>Additional information about the bake sale adds interest to the report.</p> <p>The report has no spelling or grammar errors.</p> <p>Report contains the pie and line graphs.</p> <p>Graphs are placed to illustrate the information in the report.</p> <p>The report layout is well-balanced, and the text is easy to read.</p>	/7
Survey Data Analysis	
<p>The dessert selected is the most popular among students.</p> <p>The flavor of dessert that students like the most is correctly listed.</p> <p>The flavor of dessert that students like the least is correctly listed.</p>	/3
Bake Sale Recommendations Based on Calculations	
<p>The financial goal is realistic based on the amount earned from previous sales.</p> <p>The price set for each item will help to achieve the goal and is a price customers would pay.</p> <p>The number of items needed for the sale will be enough for each customer to buy at least one.</p> <p>The number of items needed for the sale will be enough to reach or exceed the financial goal.</p> <p>The amount that each person needs to bring will achieve the goal and provide enough items.</p>	/5
TOTAL	/15