Unit Title: Super Survey!

I.   UNIT OVERVIEW & PURPOSE:
Upon completion of this unit students will be able to collect data using various methods including electronic collection, represent the data graphically, and interpret and analyze collected data to solve real world problems.

II.   UNIT AUTHORS:
Karen Burcham from New Kent High School in New Kent County
Kelly Day from Freeman High School in Henrico County

III.   COURSE:
Mathematical Modeling: Capstone Course

IV.   CONTENT STRAND:
Data Analysis

V.   OBJECTIVES:
The student will collect, represent, analyze, and interpret data.

VI.   MATHEMATICS PERFORMANCE EXPECTATION(s):
MPE 9: The student will design and conduct an experiment/survey. Key concepts include:
 a) sample size; b) sampling technique; c) controlling sources of bias and experimental error; d) data collection; and e) data analysis and reporting.

VII.   CONTENT:
This unit will focus primarily on data collection through administration of a survey. Other key ideas will include basic market research and knowledge of market competition.

VIII.   REFERENCE/RESOURCE MATERIALS:
Students will need to use a computer with internet access. They will also need graph paper and materials to make visual displays for their final presentations.

IX.   PRIMARY ASSESSMENT STRATEGIES:
Final, formal assessment will happen at the end of the unit through submission of a formal project and a presentation to the class. Informal assessments will also occur throughout the unit to check for student understanding. Students may also be asked to keep a journal recording any thoughts or ideas they have, or questions that come up during the process.

X.   EVALUATION CRITERIA:
Students will be evaluated on creation of a survey, administration of the survey, collection of data and analysis of the results. Then they will have to present their findings to the class.

XI.   INSTRUCTIONAL TIME:
6 days to complete the unit.

Lesson 1 Super Survey Creation

Strand: Data Analysis

Mathematical Objectives

Students will be able to collect, analyze, and interpret data, use mathematical and computer technology to collect and represent data, build graphical representations for a set of data, and solve real world problems using data analysis.

Mathematics Performance Expectations

Virginia College and Career Ready Mathematics Performance Expectations

- Provide a substantial, analytical focus on systematic mathematical research and investigation, argumentation in support of mathematical problem solving pathways, and individual, small groups and large-group collaborative work;
- Build upon topics both provided and self-generated;
- Use presentation and other communication technologies to develop, refine, and share developed solutions, ideas, and problems.

Related SOL

A.11 - The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve real-world problems, using mathematical models. Mathematical models will include linear and quadratic functions.

AFDA.8 - The student will design and conduct an experiment/survey. Key concepts include: a) sample size; b) sampling technique; c) controlling sources of bias and experimental error; d) data collection; and e) data analysis and reporting.

NCTM Standards

- know the characteristics of well-designed studies, including the role of randomization in surveys and experiments;
- understand histograms, parallel box plots, and scatterplots and use them to display data

Materials/Resources

- Students will need to use a computer with internet access, word processing program and spreadsheet software.
- graph paper
- materials to make visual displays for their final presentations.

Assumption of Prior Knowledge

- Students must have basic knowledge of ways to represent data through graphs and charts.
- Students may have difficulty accepting data that does not agree with their own opinions.

Introduction: Setting Up the Mathematical Task

- Initial Introduction:
    - In this lesson, you will consider some of your favorite products and ultimately pick one that you would like to conduct a survey on.
- Timeline:
    - Today you will pick a product you are interested in that has at least one obvious competitor. Then consider what features may lead consumers to choose your product over its competitor. Next, consider the information you hope to obtain from the survey, what question(s) do you want the survey to answer? After that you will make predictions about how you think the experiment will turn out.
    - Tomorrow you will set up a survey through electronic means.
- First steps:
    - Think about and write down your favorite products. It can be something you eat, drink, wear, drive, basically anything you have to buy.
    - Next, pair each of them up with an obvious competitor. Skip over any products you cannot think of obvious competitors for.
- Instructional Techniques:
    - Think/pair/share will be used. First students will think about their favorite products and competitors, then they will partner up and share their results.
- Students will conduct mock surveys in the classroom to practice gathering data.
- Prior knowledge:
    - Students will be asked to draw upon their prior knowledge of products, marketing and market competitors.
- Understanding the task:
    - The teacher will ask leading questions to get the students thinking about all the products they use as he/she walks around the room.
- Upon completion of the survey, the students will put together a presentation to display their understanding.

Student Exploration 1:

The goal of this lesson is two parts: first to get students thinking about products they have opinions about and second to design a survey that they will ultimately use to gather and analyze data. One specific strategy that is being developed is survey design with an end goal of data collection and analysis.

Individual Work: Students will consider their favorite products and their competition individually first.

Small Group Work: Students will work in pairs to pick a product to focus their survey on. Then they will begin to create a survey to collect data.

Whole Class Sharing/Discussion: Students will share ideas as a group before beginning the actual task of data collection.

Student/Teacher Actions:
1. Students will first decide what the specific goal of the survey is.
    a. For example, the goal of the survey might be to discover whether Coke is preferred over Pepsi by men or women and in which age brackets in order to launch an advertising campaign for spring break travels.
2. Students will be able to express opinions about what they think a good survey should contain. Students will then be paired and allowed to decide what type of survey they would like to conduct and what the purpose of the survey will be. After deciding the type of survey to conduct and its goal, the pairs will create a survey and collect data from classmates as a trial run.
3. Students will be encouraged to make adjustments to the intended survey to limit outcomes.
4. The teacher will lead the initial discussion and use guiding questions to lead students to understanding the task. The teacher will use questions such as but not limited to:
    a) Why do we need to do surveys?
    b) Who uses the information provided by surveys?
    c) Name types of businesses that would benefit from data -based decisions made from using surveys.
    d) Name and describe types of surveys.

The teacher will then move the questioning to be more specific to the task to be performed. After assigning partners, the teacher will continue to lead until the students have grasped the concept of surveys. Moving about the room the teacher will answer questions presented by students and encourage students to choose a main theme for the survey they wish to do, checking progress of each team to ensure the task is being completed.

The teacher will also explain the grading rubric and set some parameters of the survey:
    a) The survey must have a clearly stated purpose, and an explanation of why this topic was chosen must be included.
    b) The survey must be 4 questions that are clearly stated so that there is no need for clarification when people take the survey.
    c) Each question should have choices that meet the needs/opinions of every person.

Monitoring Student Responses
- The teacher expects:

- o students to communicate their thinking and their new knowledge verbally and in writing.
  - o students to discuss and decide as a team what to survey and how to conduct the survey.
  - o the teacher and/or students to highlight and clarify the ideas being grappled with verbally and in writing.
  - o the teacher to assist students who have difficulties; and
  - o the teacher to extend the material for students that are ready to move forward.
- Lesson summary: by the end of the period the student teams will have discussed and decided the following:
  - o What product/service will be included in the survey
  - o Method of conducting the survey
  - o Questions to be answered using the survey
- Closure of the lesson: Each team is responsible for presenting survey ideas and set up to the teacher for approval and suggestions.
- Collecting evidence of students' knowledge of the content described: Assessment will be informal through discussion and written material with the student.

Assessment

Lesson 1: Observation, student questions
- **Question**
  Were students able to create surveys effectively?

- **Journal/writing prompts**
  1. If I owned a business the survey technique I would use most often is.......
  2. Using surveys will help companies......

Extensions and Connections (for all students)

Lesson extensions/follow-up: before continuing with lesson 2 of the unit the teacher will connect with each team to verify the task is correctly done to this point. Students who are not on target will be further assisted by the teacher until the students have correctly completed the initial set up for the task. Time outside of class will be offered when necessary.

Strategies for Differentiation

- Ideas for addressing needs of a diverse population of students such as:
  - extended time for students with learning disabilities
  - use of computer generated graphs and representations.
  - English language learners (ELLs) will also be provided with written instructions for interpreters to use to assist in reading.
  - high-ability students will be provided with extended rubrics for grading purposes, as requested by the students.
  - instructions will be given verbally and in writing.

Lesson 2 Are you a Survey Monkey?

Strand: Data Analysis

Mathematical Objectives
Students will be able to collect, analyze, and interpret data, use mathematical and computer technology to collect and represent data, build graphical representations for a set of data, and solve real world problems using data analysis.

Mathematics Performance Expectations
Virginia College and Career Ready Mathematics Performance Expectations
- Provide a substantial, analytical focus on systematic mathematical research and investigation, argumentation in support of mathematical problem solving pathways, and individual, small groups and large-group collaborative work;
- Build upon topics both provided and self-generated;
- Use presentation and other communication technologies to develop, refine, and share developed solutions, ideas, and problems.

Related SOL
A.11 - The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve real-world problems, using mathematical models. Mathematical models will include linear and quadratic functions.

AFDA.8 - The student will design and conduct an experiment/survey. Key concepts include: a) sample size; b) sampling technique; c) controlling sources of bias and experimental error; d) data collection; and e) data analysis and reporting.

NCTM Standards
- know the characteristics of well-designed studies, including the role of randomization in surveys and experiments;
- understand histograms, parallel box plots, and scatterplots and use them to display data

Materials/Resources

- Students will need access to a computer for this lesson.
- Students will need internet access to visit the site listed to explore the possibilities for creating a survey.

Assumption of Prior Knowledge
- Students should be familiar with Google searches to find the designated sites.
- Students should be familiar with proper terminology associated with data collection and surveys.
- Some students may find creating a survey electronically somewhat challenging.
- Students should already be familiar with data collection to some degree.
- Students will use prior knowledge to create graphical representations of their survey results.
- Students will use knowledge of business practices (advertising) to create real world surveys to solve real world problems.

Introduction: Setting Up the Mathematical Task

- Initial Introduction:
    o In this lesson, you and your teammate will search the internet to investigate the possible survey techniques that could be used.
- Timeline:
    o Today you will pick a method of electronic surveying and write your survey questions. You will also send your survey out for responses.
    o Tomorrow you collect the data from the survey and begin organizing it.
- First steps:
    o Think about what you are trying to accomplish. What is the goal of your survey?
    o Next, write questions and clear response choices.
    o Use the survey technique that you chose to create and send your survey.
- Instructional Techniques:
    o Think/pair/share will be used. First students will think about their favorite products and competitors, then they will partner up and begin researching techniques.
    o Students will be taken to the computer lab to conduct the research and create the survey.
- Prior knowledge:
    o students will be asked to draw upon their prior knowledge of products, marketing and market competitors.
- Understanding the task
    o The teacher will ask leading questions to get the students thinking about the type of survey they want to use as he/she walks around the room.

- Upon completion of the survey, the students will send the survey to the intended audience and wait for responses.

Student Exploration 1:

Students will explore methods of collecting data by investigating website representations. Students will choose the method preferred by the team and create the survey using one of electronic devices. The goal of the exploration is to find the most appropriate technique for the intended use. Students will use the data to solve a real world problem.

Small Group Work: Students will work in pairs to create a survey and collect data.

Whole Class Sharing/Discussion: Students will share ideas as a group before beginning the actual task of data collection.

Student/Teacher Actions:
1. Students will be able to express opinions about what they think a good survey should contain.
2. Students will then be paired and allowed to decide what type of survey they would like to conduct.
3. After deciding the type of survey to conduct, the pairs will create a survey and collect data from classmates as a trial run.
4. Students will be encouraged to make adjustments to the intended survey to limit outcomes.
5. The teacher will lead the initial discussion and use guiding questions to lead students to understanding the task. The teacher will use questions such as but not limited to:
   a. Why do we need to do surveys?
   b. Who uses the information provided by surveys?
   c. Name types of businesses that would benefit from data -based decisions made from using surveys.
   d. Name and describe types of surveys.
6. The teacher will name and explain different engines on the internet that are available to conduct surveys. The teacher will also briefly discuss the advantages and disadvantages of one engine versus another. For this specific project, students will be using survey monkey.
7. The teacher will then move the questioning to be more specific to the task to be performed. After assigning partners, the teacher will continue to lead until the students have grasped the concept of surveys. Moving about the room the teacher will answer questions presented by students and encourage students to choose a main theme for the survey they wish to do, checking progress of each team to ensure the task is being completed.

Monitoring Student Responses
- The teacher expects:
  - students to communicate their thinking and their new knowledge verbally and in writing.
  - students to discuss and decide as a team what to survey and how to conduct /represent the survey.
  - the teacher and/or students to highlight and clarify the ideas being grappled with verbally and in writing.
  - the teacher to assist students who have difficulties; and
  - the teacher to extend the material for students that are ready to move forward.
- Lesson summary: by the end of the period the student teams will have discussed and decided the following:
  - What product/service will be included in the survey
  - Method of conducting the survey
  - Questions to be answered using the survey
- Closure of the lesson: Each team is responsible for presenting survey set up to the teacher for approval and suggestions.
- Collecting evidence of students' knowledge of the content described: Assessment will be informal through discussion and written material with the student.

Assessment

Lesson 2: Observation and formal grade for creating the survey
- **Questions**
  - Were students able to create surveys using the desired electronic device effectively?
  - What was difficult/easy about using this technology as opposed to standard surveying techniques?

- **Journal/writing prompts**
  1. If I owned a business the survey technique I would use most often is.......
  2. Using surveys will help companies......

- **Other**: Final Unit Assessment: Scoring Rubric (see last page)

Extensions and Connections (for all students)

Lesson extensions/follow-up: before continuing with lesson 3 of the unit the teacher will connect with each team to verify the task is correctly done to this point. Students who are

not on target will be further assisted by the teacher until the students have correctly completed the initial set up for the task. Time outside of class will be offered when necessary.

Strategies for Differentiation

- Ideas for addressing needs of a diverse population of students:
  - o extended time for students with learning disabilities
  - o use of computer generated graphs and representations.
  - o English language learners (ELLs) will also be provided with written instructions for interpreters to use to assist in reading.
  - o high-ability students will be provided with extended rubrics for grading purposes, as requested by the students.
  - o instructions will be given verbally and in writing.

Lesson 3 Organizing the Output

Strand: Data Analysis

Mathematical Objectives
Students will be able to collect, analyze, and interpret data, use mathematical and computer technology to collect and represent data, build graphical representations for a set of data, and solve real world problems using data analysis.

Mathematics Performance Expectations
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Related SOL
A.11 - The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve real-world problems, using mathematical models. Mathematical models will include linear and quadratic functions.

AFDA.8 - The student will design and conduct an experiment/survey. Key concepts include: a) sample size; b) sampling technique; c) controlling sources of bias and experimental error; d) data collection; and e) data analysis and reporting.

NCTM Standards
- know the characteristics of well-designed studies, including the role of randomization in surveys and experiments;
- understand histograms, parallel box plots, and scatterplots and use them to display data

Materials/Resources
- Students will need to use a computer with internet access, word processing program and spreadsheet software.
- graph paper
- materials to make visual displays for their final presentations.

Assumption of Prior Knowledge
- Students must have basic knowledge of ways to represent data through graphs and charts.
- Students may have difficulty accepting data that does not agree with their own opinions.

Introduction: Setting Up the Mathematical Task

- Initial Introduction:
    - Now as surveys are being completed there is data coming in that needs to be organized and ultimately analyzed.
- Timeline:
    - Today you will come up with a way to record and sort the data as it comes in. Using a graphic organizer may help you sort the data more efficiently.
    - Tomorrow you will begin the process of analyzing the data and drawing conclusions.
- First steps:
    - Consider the method you used to administer your survey. As the results come in you will need one central place to put them. You may want to place a folder on your jump drive to save the data in.
    - Ultimately the data should end up in a spreadsheet.
- Instructional Techniques:
    - Students will consider ways of sorting through survey responses by listening to suggestions from classmates. Some suggestions could be: alphabetical order of word responses, numerical order of number responses, categorical order of responses such as color or size.
- Prior knowledge:
    - students will be asked to draw upon their prior knowledge of surveys
- Understanding the task:

o   The teacher will ask leading questions to get the students thinking as he/she walks around the room.

Student Exploration 1:

In this lesson your group will consider identifying categorical data from respondents and decide how to sort the responses. Then they will put a plan in place to make sure all survey results are recorded accordingly.

Small Group Work: If your survey included identifying categorical data for respondents to answer, you should sort the results according to what you determine is most important. For example, if you want to compare the preference of Pepsi versus Coke among men versus women, you should sort the survey results of the men together and the results of the women together.

Whole Class Sharing/Discussion: Students will share suggestions on what identifying information survey results should be sorted by.

Student/Teacher Actions:
1.   Students will decide how to sort the information that is coming in.
2.   Teacher will make suggestions and offer insights in possible ways of sorting.
3.   Students must have at least 30 survey responses.

Monitoring Student Responses
- The teacher expects:
  o   students to communicate their thinking and their new knowledge verbally and in writing.
  o   students to discuss and decide as a team how to organize their survey responses.
  o   the teacher and/or students to highlight and clarify the ideas being grappled with verbally and in writing.
  o   to assist students who have difficulties
  o   to extend the material for students that are ready to move forward.

- Lesson summary: by the end of the period the student teams will have discussed and decided the following:
  o   What identifying information is useful in sorting the responses?
  o   Put steps in place and begin sorting the data accordingly.
- Closure of the lesson: Each team is responsible for presenting sorting techniques to the teacher for approval.

- Collecting evidence of students' knowledge of the content described: Assessment will be informal through discussion and written material with the student.

Assessment

- Assessment of students' knowledge will occur through informal observation and student questions

- **Question**
  Which piece of identifying information did you determine was the most relevant for your product comparison?

- **Journal/writing prompts**
  1. Explain why this method of sorting the data makes the most sense to you.
  2. What are some other ways the data could be sorted?

Extensions and Connections (for all students)

Lesson extensions/follow-up: before continuing with lesson 4 of the unit the teacher will connect with each team to verify the task is correctly done to this point. Students who are not on target will be further assisted by the teacher until the students have correctly completed the initial set up for the task. Time outside of class will be offered when necessary.

Strategies for Differentiation

- Ideas for addressing needs of a diverse population of students:
  - extended time for students with learning disabilities
  - use of computer generated graphs and representations.
  - English language learners (ELLs) will also be provided with written instructions for interpreters to use to assist in reading.
  - high-ability students will be provided with extended rubrics for grading purposes, as requested by the students.
  - instructions will be given verbally and in writing.

Lesson 4 Survey Says?????

Strand: Data Analysis

Mathematical Objectives
Students will be able to collect, analyze, and interpret data, use mathematical and computer technology to collect and represent data, build graphical representations for a set of data, and solve real world problems using data analysis.

Mathematics Performance Expectations
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- Provide a substantial, analytical focus on systematic mathematical research and investigation, argumentation in support of mathematical problem solving pathways, and individual, small groups and large-group collaborative work;
- Build upon topics both provided and self-generated;
- Use presentation and other communication technologies to develop, refine, and share developed solutions, ideas, and problems.

Related SOL
A.11 - The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve real-world problems, using mathematical models. Mathematical models will include linear and quadratic functions.

AFDA.8 - The student will design and conduct an experiment/survey. Key concepts include: a) sample size; b) sampling technique; c) controlling sources of bias and experimental error; d) data collection; and e) data analysis and reporting.

NCTM Standards
- know the characteristics of well-designed studies, including the role of randomization in surveys and experiments;
- understand histograms, parallel box plots, and scatterplots and use them to display data

Materials/Resources
- Students will need access to computers to create spreadsheets and graphs
- Students will need graph paper
- Teacher will provide direction for using Excel to create the final representation.

Assumption of Prior Knowledge
- Students should be able to build graphical representations of sets of data.
- Students should be operating on Analysis level on Van Hiele scale with respect to data analysis
- Students should be able to make connections within the activity and apply them to real world situations.
- Some students may struggle with creating a spreadsheet

Introduction: Setting Up the Mathematical Task

- Initial Introduction:
  - In this lesson, you will decide how you want to represent your findings
- Timeline:
  - Today you will construct a spreadsheet and create a graph to represent your data
  - Tomorrow you will present your findings to the class.
- First steps:
  - First look at the type of data you have collected. Determine the mean, median and mode. Interpret these measures as they apply to your data.
  - Next, decide what type of graph will best represent your data, then using a spreadsheet create the graph.
  - Your main goal is to analyze the data as it pertains to your initial question.
- Instructional Techniques:
  - Think/pair/share will be used. Students will partner up and share their results.
- Prior knowledge:
  - students will be asked to draw upon their prior knowledge of graphical representations.
- Understanding the task
  - The teacher will ask leading questions to get the students thinking:
    - What was the initial question I wanted answered?
    - Does my graph represent my data effectively?
    - Did I answer my initial question?
- Upon completion of the survey, the students will put together a presentation to display their understanding.

Student Exploration 1:

Today students will explore the types of graphical representations that could be used to represent a set of data. Students will decide which of these will best fit the data they have collected. Students will then use the method of choice to create a presentation for the data they collected.

Small Group Work: Students will work in pairs to represent the survey and collect data.

Whole Class Sharing/Discussion: Students will share ideas as a group before beginning the actual task of creating the final presentation.

Student/Teacher Actions:
- Students will decide how to present their findings
- Teacher will make suggestions and offer insights in possible ways of communicating their findings.

Monitoring Student Responses
- The teacher expects:
    - students to communicate their thinking and their new knowledge verbally and in writing.
    - students to discuss and decide as a team how to organize their survey conclusions.
    - the teacher and/or students to highlight and clarify the ideas being grappled with verbally and in writing.
    - to assist students who have difficulties
    - to extend the material for students that are ready to move forward.
- Lesson summary: by the end of the period the student teams will have discussed and decided the following:
    - What identifying information is useful in sorting the responses.
    - Put steps in place and begin sorting the data accordingly.
- Closure of the lesson: Each team is responsible for presenting sorting techniques to the teacher for approval.
- Collecting evidence of students' knowledge of the content described: Assessment will be informal through discussion and written material with the student.

Assessment

- Assessment of students' knowledge will occur through informal observation and student questions
- **Questions**
    - Were students able to create representations that best fit the data collected?
    - What was difficult/easy about using technology as opposed to drawing graphs by hand?

- **Journal/writing prompts**
    - Business owners often use surveys to predict trends in the merchandise or service they provide the community. If I owned my own business I would use........
- **Other**: Final Unit Assessment: Students will be graded using a scoring rubric for the presentation part of the assignment.

Extensions and Connections (for all students)

Lesson extensions/follow-up: before continuing with lesson 5 of the unit the teacher will connect with each team to verify the task is correctly done to this point. Students who are not on target will be further assisted by the teacher until the students have correctly completed the initial set up for the task. Time outside of class will be offered when necessary.

Strategies for Differentiation

- Ideas for addressing needs of a diverse population of students:
    - extended time for students with learning disabilities
    - use of computer generated graphs and representations.
    - English language learners (ELLs) will also be provided with written instructions for interpreters to use to assist in reading.
    - high-ability students will be provided with extended rubrics for grading purposes, as requested by the students.
    - instructions will be given verbally and in writing.

Lesson 5 Pretty Presentations

Strand: Data Analysis

Mathematical Objectives
Students will be able to collect, analyze, and interpret data, use mathematical and computer technology to collect and represent data, build graphical representations for a set of data, and solve real world problems using data analysis.

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AFDA.8 - The student will design and conduct an experiment/survey. Key concepts include: a) sample size; b) sampling technique; c) controlling sources of bias and experimental error; d) data collection; and e) data analysis and reporting.

NCTM Standards
- know the characteristics of well-designed studies, including the role of randomization in surveys and experiments;
- understand histograms, parallel box plots, and scatterplots and use them to display data

Materials/Resources
- Students will need to use a computer with internet access, word processing program and spreadsheet software.
- graph paper
- materials to make visual displays for their final presentations.

Assumption of Prior Knowledge
- Students must have basic knowledge of ways to represent data through graphs and charts.
- Students may have difficulty accepting data that does not agree with their own opinions.

Introduction: Setting Up the Mathematical Task

- Initial Introduction:
    - In this lesson, you will pull together all the work from the last four lessons and create one final presentation that will be shared with the class.
- Timeline:
    - Presentations will begin tomorrow.
- First steps:
    - Summarize the work you have done this week, including product decision, survey creation, execution, data organization and analysis.
    - Next, consider how your initial predictions compare with the results of the survey.
- Instructional Techniques:

- o Think/pair/share will be used. First students will think about their own predictions then they will return to their groups and make comparisons.
- Prior knowledge:
  - o students will be asked to draw upon their prior knowledge of products, marketing and market competitors.
- Understanding the task
  - o The teacher will ask leading questions to get the students thinking about all the products they use as he/she walks around the room.

Student Exploration 1:

At this stage students will pull together all the data they've collected and compare the results of their surveys to their initial predictions. Ultimately they will produce a final project that will be presented to the class.

Individual Work: students will recall their initial predictions and compare them to the results of the survey.

Small Group Work: Students will work together to create a final presentation that shows the class their product, competitor, survey, and results. They will also share their analysis and make predictions.

Whole Class Sharing/Discussion: Students will share ideas as a group before beginning the actual task of data collection.

Student/Teacher Actions:
- Students will be reminded of proper classroom etiquette concerning peer presentations by the teacher before presentations begin.

Assessment

- Assessment of students' knowledge will occur through formal scoring of their presentation using the rubric.

- **Journal/writing prompts**
  - o How did your initial predictions compare with your final results?

Strategies for Differentiation

- Ideas for addressing needs of a diverse population of students:

- extended time for students with learning disabilities
- use of computer generated graphs and representations.
- English language learners (ELLs) will also be provided with written instructions for interpreters to use to assist in reading.
- high-ability students will be provided with extended rubrics for grading purposes. as requested by the students.
- instructions will be given verbally and in writing..

Rubric for **Super Survey!** Project

Group Members: _____

Topic: _____

Category	10	7	4	0	Points Earned
Ready to Present	The group is ready to present on the due date.	-	-	The group is not ready to present on the due date.	
Creative Topic	The topic is creative and a genuine interest is shown.	The topic is creative, but an interest in the topic is lacking.	The topic is not creative, and no interest is shown.	There is no sign that a single topic has been chosen.	
Choosing a Population	An explanation of how and why you chose the population you did is clear.	An explanation of how and why you chose the population you did is somewhat clear – some questions remain.	An explanation of how and why you chose the population you did is not clear – many questions remain.	No explanation of how and why you chose the population you did is given.	
Choosing a Sample Technique	The sampling technique chosen is well understood and an explanation for its selection is clear.	The sampling technique chosen is somewhat well understood and the explanation for its selection is somewhat clear.	The sampling technique chosen is not well understood and the explanation for its selection is not clear.	No sampling technique is used and no explanation is given.	
Survey Questions	A minimum of four questions are submitted. Questions are well thought out and meaningful to the topic.	A minimum of four questions are submitted. Questions are somewhat well thought out but could be improved.	A minimum of four questions are submitted. Questions need a lot of work and/or are biased in their wording.	Less than four questions are submitted.	

Results	Results are communicated clearly (table, list, figures, etc.)	Results are communicated somewhat, although could be better organized. (table, list, figures, etc.)	Results are communicated poorly – many questions remain (table, list, figures, etc.)	Results are not communicated at all (no table, list, figures, etc.)	
Sources of Bias	A strong attempt is made to look for and discuss possible sources of bias in the data collection process.	A mediocre attempt is made to look for and discuss possible sources of bias in the data collection process.	A poor attempt is made to look for and discuss possible sources of bias in the data collection process.	No attempt is made to look for and discuss possible sources of bias in the data collection process.	
Descriptive Stats and Visual Display	Both descriptive stats and a visual are provided and help communicate the results.	Both descriptive stats and a visual are provided, but they do nothing to help communicate the results.	Either the descriptive stats or the visual are missing from the presentation.	Both the descriptive stats and a visual are missing from the presentation.	
Interpretation	The interpretation paragraph is well thought out and is supported by the stats that were calculated.	The interpretation paragraph is somewhat well thought out and is supported by the stats that were calculated.	The interpretation paragraph is not well thought out and is not supported by the stats that were calculated.	No interpretation paragraph is given.	
Reflection	The reflection paragraph is well thought out and meaningful.	The reflection paragraph is somewhat well thought out and somewhat meaningful.	The reflection paragraph is poorly thought out and not meaningful.	No reflection paragraph is given.	

Total Score: