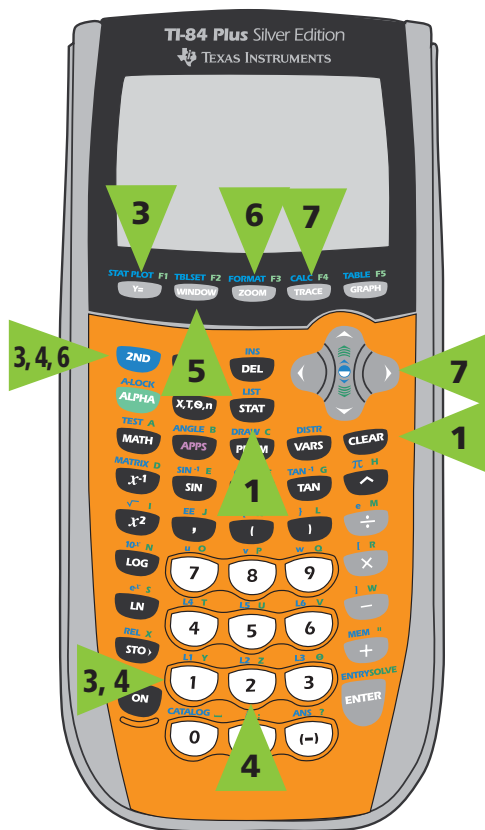




Creating a Scatter Plot

1. Press **STAT** and **ENTER** to access Stat List editor. Delete any data in **L1** and **L2** by highlighting the title and pressing **CLEAR**, then **ENTER**.
2. Enter the following data in **L1**: {2,4,6,8} and in **L2**: {7,13,19,25} by typing each number and pressing **ENTER**.
3. Press **2ND** and then **Y=** to access the **STAT PLOTS** menu. Press **1** to access **Plot1**.
4. Highlight **On** and press **ENTER** to select it. Next to **Type**, select the scatter plot (first icon); next to **Xlist** type **L1** (**2ND**, **1**); next to **Ylist** type **L2** (**2ND**, **2**); and by **Mark** select the square shape.
5. Press the **WINDOW** key. Create a window to fit the data by entering the values shown in the screen shot.
6. Press **2ND** and then **ZOOM** to access **FORMAT**. Highlight all the choices in the left column.



7. Press **GRAPH** and then **TRACE** to view the scatter plot. Use the right/left arrow keys to observe the coordinates of the points.

Special Note: If a line appears on the Stat Plot, turn off the graph, by pressing **Y=**, highlighting (=) by the function, and pressing **ENTER**.

1, 2

L1	L2	L3	2
2	7		
4	13		
6	19		
8	25		

3

```

STAT PLOTS
1:Plot1...On
   Type: L1 1
2:Plot2...Off
   Type: L1 L2
3:Plot3...Off
   Type: L1 L2
4:PlotsOff
    
```

3, 4, 6

3, 4

4

```

Plot2 Plot3
On Off
Type:
Xlist:L1
Ylist:L2
Mark:
    
```

5

```

WINDOW
Xmin=0
Xmax=10
Xscl=1
Ymin=0
Ymax=30
Yscl=1
Xres=1
    
```

6

```

RecOn PolarGC
CoordOn CoordOff
GridOff GridOn
AxesOn AxesOff
LabelOff LabelOn
ExprOn ExprOff
    
```

7

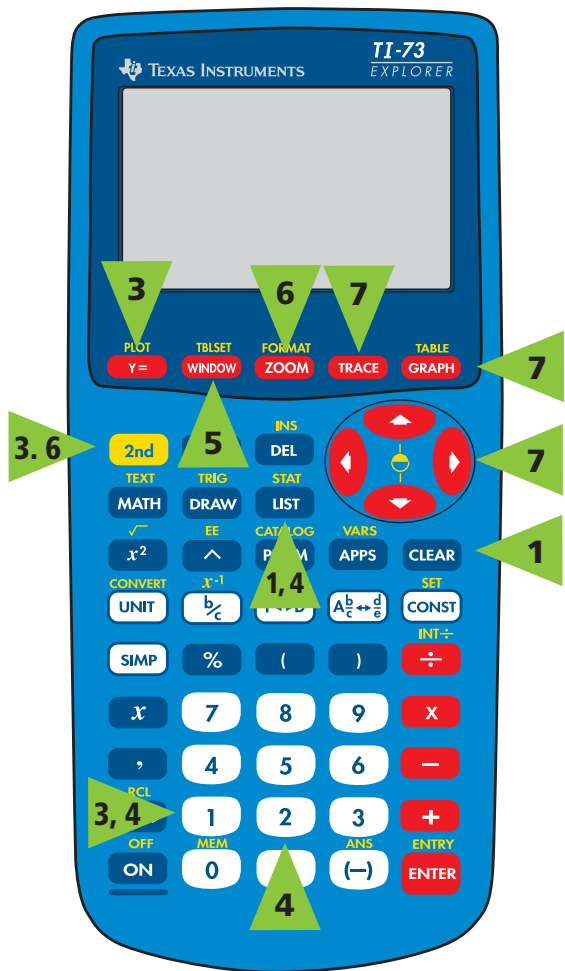


Creating Stat Plots

TI-73 Explorer™ How-to Card 65

Creating a Scatter Plot

1. Press **LIST** to access List editor. Delete data in **L1** and **L2** by highlighting the title and pressing **CLEAR**, then **ENTER**.
2. Enter **{2,4,6,8}** in **L1** and **{7,13,19,25}** in **L2** by typing the number and pressing **ENTER**.
3. Press **2nd** and then **Y=** to access the **STAT PLOTS** menu. Press **1** to access **Plot1**.
4. Highlight **On** and press **ENTER** to select it. Next to **Type**, select the scatter plot (first icon); next to **Xlist** type **L1** (**2nd, LIST, 1** keys); next to **Ylist** type **L2** (**2nd, LIST, 2**); and by Mark select the square shape.
5. Press the **WINDOW** key. Create a window to fit the data by entering the values shown in the screen shot.
6. Press **2nd** and then **ZOOM** to access **FORMAT**. Highlight all the choices in the left column.



7. Press **GRAPH** and then **TRACE** to view the scatter plot. Use the right/left arrow keys to observe the coordinates of the point.

1, 2

L1	L2	L3
2	7	
4	13	
6	19	
8	25	

3

```

STAT PLOTS
1:Plot1...Off
  L1 L2
2:Plot2...Off
  L1 L2
3:Plot3...Off
  L1 L2
4↓PlotsOff
    
```

3

```

Plot1  Off
Type:     
Xlist:L1
Ylist:L2
Mark: 
    
```

4

```

OPS MATH CALC
1: L1
2: L2
3: L3
4: L4
5: L5
6: L6
7↓HEIGHT
    
```

4

```

WINDOW
Xmin=0
Xmax=10
eX=.1063829787...
Xscl=1
Ymin=0
Ymax=30
Yscl=1
    
```

5

```

CoordOn CoordOff
GridOff GridOn
AxesOn AxesOff
LabelOn LabelOff
ExprOn ExprOff
    
```

6

7

How Much Blood Do You Have?

Lesson Plan

Science Objectives

- Students will learn that blood cells are specialized to carry out specific functions that are needed to sustain life.
- Students will learn that an organism is able to regulate its internal environment while living in a constantly changing external environment.

Resources Needed

Prior to beginning this project, students need:

- TI-73 Explorer™ or TI-83/84 Plus Family Calculator
- *How Much Blood Do You Have?* Student Project Card (page 8)
- *How Much Blood Do You Have?* Data Collection Sheet (page 9)
- *How Much Blood Do You Have?* Rubric and Scoring Sheet (page 10)
- *TechTools Resource Kit for the TI Graphing Calculators* “How-to” Cards

Internet Resources

This project uses websites that are linked to the *TechTools Resource Kit for the TI Graphing Calculators* Internet site at <http://www.tcmpub.com/urlupdates/>.

Procedure

Student Preparation

1. Ask students the following questions. Use the questions to promote thinking about the life cycle of a blood cell.
 - How much blood do you have in your body? (*Tell students that in this project they will have a chance to discover the real answer.*)
 - Do you think you maintain the same amount of blood during your entire lifetime except for any that is lost due to cuts or other injuries? (*Answer: The human body continually creates new blood and disposes of old blood.*)
 - What is *blood type*? (*Tell students a person must receive the correct type of blood if they require a blood transfusion.*)
2. Explain to students that they are to create a brochure about the amount of blood in the body and the life cycle of a blood cell for potential blood donors.
 - Show students the websites linked to the pages at <http://www.tcmpub.com/urlupdates/>. Here students can review information about the history of blood banks and the life cycle of a blood cell.

Procedure *(cont.)*

- Explain to students that in this project they will study data, which relates the mass of a human body to the amount of blood that it contains in liters. They are to plot this data, using the Manual-Fit function to create a line of best fit. They are to then use the data to predict how much blood they have in their own body.
3. Read the project card challenge to the students.
 - Explain to students that a line of best fit is drawn on a scatter plot to estimate a relationship between two sets of data, which in this case is body weight and gallons of blood.
 - Explain to students that the following components should be included in their brochures: the blood cell's formation, function, life cycle, life span, and disposal once its journey through the body is completed. Remind students that they are writing from the first person perspective; hence, they are pretending to be a blood cell. Together, create a sample brochure to serve as a model.
 4. Review the use of the “How-to” cards.
 - Review how to enter data in the Stat List editor.
 - Review how to create a scatter plot.
 - Review how to use the Manual Fit function.
 5. Explain the scoring rubric to students.
 - It is important for students to see the rubric and understand that their grades will be based on how they perform as measured by the rubric.
 - Review the three levels of performance and ask the students which level they would like to achieve and why.
 - Check for understanding by asking students to describe examples of projects at each level.

Presentation

- Have students exchange brochures with other members of the class for feedback. Have students offer positive feedback as they observe their classmates' work. Allow students to make changes to their brochures after receiving feedback from fellow classmates.
- Arrange for students to display their brochures at a local Red Cross or share them with a donor at a local blood drive.

Assessment

- Utilize the rubric to assess the students' performance.
- Allow students to assess their own work as well as that of at least one classmate.

Extension Ideas

- Have students research the accomplishments of Charles R. Drew and write a biography about his life.
- Have students write a short research paper about sickle cell anemia.

How Much Blood Do You Have?

Student Project Card

Charles R. Drew invented the first blood bank, and his project was the model for the Red Cross system of blood banks. A blood bank collects blood from volunteer donors. The blood is analyzed to determine its type and is then processed and stored. It is eventually passed on to someone needing a blood transfusion by matching blood types. Today, blood banks or blood drives are frequently held in community centers, churches, and schools. Food and drink are provided to the donors and volunteers. Often, there are additional activities and presentations to attract donors to the event. In this project, you are to create a brochure that includes information on the amount of blood in the body and the life of a blood cell, in hopes that by educating the community more people will donate blood.

To complete this project you must:

1. Study the table on the *How Much Blood Do You Have?* Data Collection Sheet and transfer the data into the Stat List editor on the calculator. L1 will represent the body weight in pounds and L2 will represent the blood volume in gallons.
2. Set up a ZoomStat Window and then create a scatter plot of data. Turn ON Stat Plot 1 and select the scatter plot (the first from the left). Enter L1 (body weight) for the x-axis or Xlist. Enter L2 (gallons of blood) for the y-axis or Ylist. Press the GRAPH key to plot the line. Record the scatter plot on the Data Collection Sheet.
3. Create a line of best fit on the scatter plot using the Manual-Fit Function in the Calc submenu.
4. Use the line of best fit and the equation in the left-hand corner of the screen to determine your own blood volume.
5. Answer the question about the best fit line and the quantity of blood in a pretend donor on the Data Collection Sheet.
6. Write a rough draft of a blood cell's life cycle and the different blood cell types from a first-person perspective.
7. Use the information assembled on the Data Collection Sheet to create an informative brochure for a potential donor on the quantity of blood in the body and the life of a blood cell.

Resources

Blood drive websites linked from the pages at <http://www.tcmpub.com/urlupdates/>.

Lesson adapted from:

Jeff Lukens and Bob Tower, "The River of Life," *Biology with the TI-83 Plus*.

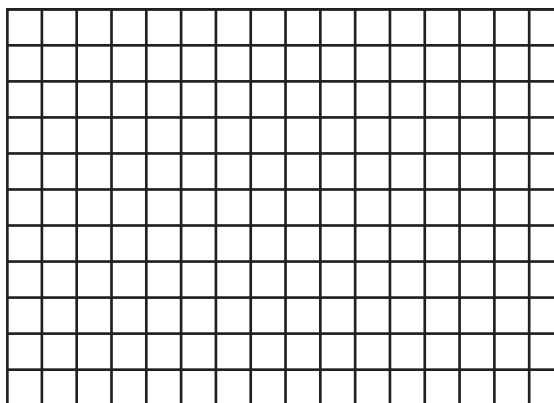


How Much Blood Do You Have?

Data Collection Sheet

L1 (Body Weight in Pounds)	L2 (Blood Volume in Gallons)
66	0.7
88	0.9
110	1.1
132	1.4
154	1.6
176	1.8
198	2.1
220	2.3
242	2.6
264	2.8
286	3.0

1. Draw the scatter plot with the line of best fit in the box below.



2. What does X represent in the line of best fit? What does Y represent on the line of best fit?

3. Using the weight of a pretend blood donor, or your own weight, estimate how many gallons of blood are in the donor's body from the line of best fit and the equation. Explain how you determined your estimate.

4. Research the life cycle of a blood cell. From the first person perspective (e.g., "I am a blood cell"), write a short paragraph about how a blood cell is made and what happens to it during its lifetime in the body. Include the function of a blood cell in the body, a blood cell's life span, and how a blood cell is disposed of once its journey through the body is complete.

5. Research the different blood types and explain why it is important for patients to get the correct types.

How Much Blood Do You Have? Rubric and Scoring Sheet

Criteria	Level I (0–4 points)	Level II (5–8 points)	Level III (9–10 points)	Self Score	Peer Score	Teacher Score
Create a scatter plot of the amount of blood in the body with a line of best fit.	Your scatter plot does not accurately represent the data and does not include a line of best fit.	Your scatter plot accurately represents the data but does not include a line of best fit.	Your scatter plot accurately represents the data and includes a line of best fit.			
Answer the questions on the Data Collection Sheet.	You answered one question correctly.	You answered two or three questions correctly.	You answered all four questions correctly.			
Create a brochure on the quantity of blood in the body and the life of a blood cell.	Your brochure does not include information on the quantity of blood in the body and the life of a blood cell.	Your brochure includes only information on the quantity of blood in the body or the life of a blood cell.	Your brochure includes information on the quantity of blood in the body and the life of a blood cell.			
Comments:	Total Score					

Let's Go to the Movies!

Lesson Plan

Math Objectives

- Students will read data from a table and create a scatter plot of a set of data.
- Students will find the linear regression for a given set of data.

Resources Needed

Prior to beginning the project, students need:

- TI-73 Explorer™ or TI-83/84 Plus Family Calculator
- *Let's Go to the Movies!* Student Project Card (page 13)
- *Let's Go to the Movies!* Data Collection Sheet (page 14)
- *Let's Go to the Movies!* Rubric and Scoring Sheet (page 15)
- *TechTools Resource Kit for the TI Graphing Calculators* How-to Cards

Internet Resources

This project uses websites that are linked to the *TechTools Resource Kit for the TI Graphing Calculators* Internet site at <http://www.tcmpub.com/urlupdates/>.

Procedure

Student Preparation

1. Ask students the following questions:
 - How much does it cost to go to the movies?
 - Do you think that it has always cost this much? What do you think the prices were in the past? What do you think the prices will be in the future?
2. Discuss with students the changes in prices over the years. What types of things may influence the costs of items? Ask students what items have increased or decreased in price over the years.
 - Show students the websites linked to the pages at <http://www.tcmpub.com/urlupdates/>. Here students can review information about scatter plots and linear regressions.
3. Read the project card challenge to students.
 - Explain to students that they will be creating a scatter plot on the graphing calculator using the data given for the average movie ticket prices from the years 1924 to 2005. They will then use the calculator to determine the line of best fit (linear regression).
 - Have the students review the table and ask if they see any trends in ticket prices. After students analyze the trends, have them predict the ticket price in the year 2189. Write these predictions either on the overhead or the board.
 - Before the students enter the data into the calculator, ask students to explain why a scatter plot is being used. Ask, "What type of scale will you use on your scatter plot to accurately display the information?"

Procedure *(cont.)*

- Discuss with the students which quadrant they will use to graph the scatter plot. Students should determine from the data that the first quadrant will be used. Have the students set up a Quadrant I window. Then, have the students input the data and create a scatter plot on the calculator. Have the students sketch the scatter plot on the *Let's Go to the Movies!* Data Collection Sheet.
 - Model how to use the scatter plot to answer the questions on the Data Collection Sheet.
 - Before finding the line of best fit, ask the students, “What is a line of best fit?” and “How is it used to solve problems?” Have students use the Manual-fit function or LinReg to find the linear regression. Students can view the equation of the line on the Y= screen.
 - Have the students sketch the line of the graph on the Data Collection Sheet. Have the students answer the rest of the questions, and then discuss them as a class.
4. Review the use of the How-to cards.
 - Review how to create a Quadrant I window.
 - Review how to enter data in the Stat List editor.
 - Review how to create a scatter plot.
 - Review how to find a linear regression, using the Manual-Fit function or the LinReg function.
 5. Explain the scoring rubric to students.
 - It is important for students to see the rubric and understand that their grades will be based on how they perform as measured by the rubric.
 - Review the three levels of performance and ask the students at which level they would like to achieve and why.
 - To check for understanding, ask students to describe examples of the projects at each level.

Presentation

- Have students share their graphs within small groups and explain to one another how they found their answers. Students should pick a representative to summarize the process to the class.
- Have students offer feedback based on the requirements found on the project page.

Assessment

- Utilize the rubric to assess students' performances.
- Allow students to assess their own work as well as that of at least one other classmate.

Extension Ideas

- Pick a time period when there was a significant change in movie prices. Have students research possible reasons for the big increase or decrease that occurred during that time period.
- Have students complete the challenge at the bottom of the Data Collection Sheet. They may have to research current concession prices at their local theater before they can find the total cost for their families.

Let's Go to the Movies!

Student Project Card

Travel in time to the year 2189. There have been many changes in the world. Parents no longer have to cook meals for their kids because a four-course meal will appear by simply pressing a button. Kids do not have to do chores because every family has a housekeeping robot. These robots even take your dog for a walk. Kids travel by hovercrafts to and from school. Schools no longer use paper and pencils. All student work is done on a handheld computer. Students beam their work to their teachers' in-boxes.

The world in 2189 really is different from ours today. One thing that has not changed, however, is movies. No matter what your age, going to the movie theater is still a favorite outing on any weekend. Theaters still sell tickets. The favorite concession item is still hot buttery popcorn and there are still famous names in lights. You can still find girls and boys "oohing" and "aahing" over their favorite actors or actresses. The lights still go down and the incredible sound truly makes it an enjoyable experience. Even the reminder to turn off all hologram phones doesn't put a damper on the experience.

The one thing, though, that has changed is movie prices. How much do you think a movie ticket costs in the year 2189? Use the table on the Data Collection Sheet to create a scatter plot of the change in movie prices over the years. Create a linear regression line to predict the prices in the future. Examine the data closely to answer the questions on the Data Collection Sheet.

To complete this project you must:

1. Transfer the data from the table on the *Let's Go to the Movies* Data Collection Sheet to the Stat List editor.
2. Set up a Quadrant I window and then create a scatter plot in Stat Plot 1. Sketch the graph on the Data Collection Sheet.
3. Use the scatter plot to answer the questions on the Data Collection Sheet.
4. Create a line of best fit on the scatter plot and sketch it on the scatter plot on the Data Collection Sheet.
5. Use the line of best fit and the equation to determine the average price of movie tickets. Then answer the remaining questions the Data Collection Sheet.

Resources

Scatter plot and linear regression websites are linked from the pages at <http://www.tcmpub.com/urlupdates/>.

Let's Go to the Movies!

Data Collection Sheet

Below is a table of the average movie ticket price from the years 1924 to 2005.

Year	Average Movie Ticket Price	Year	Average Movie Ticket Price
1924	0.25	1970	1.55
1929	0.35	1975	2.05
1935	0.24	1980	2.69
1940	0.24	1985	3.55
1945	0.35	1990	4.23
1949	0.46	1995	4.35
1954	0.45	2000	5.39
1961	0.69	2005	6.40
1965	1.01		

1. Sketch the scatter plot on the back of this page.
2. What trend do you see in the price of movie tickets over the years? _____
3. How many years was the price of a movie ticket less than a dollar? _____
4. Between which years did the price change the most? _____
5. Do you see any patterns in the change in movie prices? _____
6. Use the calculator to find the line of best fit and sketch it on the graph above.
7. What is the equation for the data points? _____
8. Do you think a line is the best choice for describing the data? _____
9. If the year were 2189, how much would you spend on a movie ticket? _____
10. What year would the movie ticket price hit an average of \$10? _____
11. How do you think the graph would change if you had the average price of movie tickets for every year between 1910 and 2005? _____

Challenge

If the price of current concessions has increased by 40 percent, how much would a night at the movies cost for your entire family?

Let's Go to the Movies Rubric and Scoring Sheet

Criteria	Level I (0–4 points)	Level II (5–8 points)	Level III (9–10 points)	Self Score	Peer Score	Teacher Score
Sketch a scatter plot of the data.	You did not sketch the scatter plot of the data.	You sketched the scatter plot with some mistakes.	You sketched the scatter plot of the data correctly.			
Sketch the line of best fit.	You did not sketch the line of best fit.	You sketched the line of best fit, but it is not correct.	You correctly sketched the line of best fit.			
Record the equation for the line of best fit.	You did not record the equation for the line of best fit.	You recorded the equation for the line of best fit, but it is not correct.	You correctly recorded the equation for the line of best fit.			
Answer the questions to analyze the data.	You did not answer all questions completely and had many mistakes.	You answered all the questions completely, with few mistakes.	You answered all the questions completely and correctly.			
Determine the movie costs in the future.	You did not determine the movie costs in the future.	You determined the movie costs in the future, but they were incorrect.	You correctly determined the movie costs in the future.			
Comments:				Total Score		

The Tortoise or the Sloth?

Lesson Plan

Math Objectives

- Students investigate a real-world situation that can be modeled by parametric functions.
- Students will understand the effects of parameter changes on functions and their graphs by writing the equation of a line in parametric form, using the calculator to graph lines, and learning how to it can serve as a parameter.

Resources Needed

Prior to beginning the project, students need:

- TI-73™ Explorer or TI-83/84 Plus Family Calculator
- *The Tortoise or the Sloth?* Student Project Card (page 3)
- *The Tortoise or the Sloth?* Data Collection Sheet (page 4)
- *The Tortoise or the Sloth?* Rubric and Scoring Sheet (page 5)
- *TechTools Resource Kit for the TI Graphing Calculators* “How-to” Cards

Internet Resources

This project uses websites that provide information about an equation of a line and the story “The Tortoise and the Hare.” Websites are linked to the *TechTools Resource Kit for the TI Graphing Calculators* Internet Site at <http://www.tcmpub.com/urlupdates/>.

Procedure

Student Preparation

1. Ask students the following questions:
 - Do you remember the story of the tortoise and the hare? What was the main idea of the story?
 - What is the equation of a line? ($y = mx + b$)
 - What does each of the variables in the equation represent in terms of rate of change and position of the line?
2. Show students the websites linked to the pages at <http://www.tcmpub.com/urlupdates/>. Here students can review information about the equation of a line and the story, “The Tortoise and the Hare.”
3. Read the project card challenge to the students.
 - Explain to students that they are to determine the winner of a race between a tortoise and a sloth, who are starting from different points and are moving in two different paths.
 - Have students graph two lines with the calculator in the simultaneous mode and discuss the relative motion of the two lines and when they reach the point of intersection.

Procedure *(cont.)*

- Explain that when finding the equation for the sloth and tortoise, students should describe the slope in terms of “change in x ” and “change in y .”
 - Explain how to create a stat plot marking each animal’s position in relation to the time. Tell students to use the sequence function to enter values for t into L1 from 0 to 100, with increments of five. Have students enter the formulas for the sloth’s path in L2 and L3 and the tortoise’s path in L4 and L5.
 - Explain how to create a parametric graph. Turn off the stat plots and then set the calculator in Parametric mode. Select the $Y=$ key and enter the sloth’s formulas into X_{1T} and Y_{1T} and the tortoise’s formulas into X_{2T} and Y_{2T} . On the Window screen, the X and Y Min, Max, and Scl are the same as the stat plot.
4. Review the use of the “How-to” cards.
 - Review how to toggle between functions.
 - Review how to enter data in the Stat List editor.
 - Review how to create a scatter plot.
 5. Explain the scoring rubric to students.
 - It is important for students to see the rubric and understand that their grades will be based on how they perform as measured by the rubric.
 - Review the three levels of performance and ask the students at which level they would like to achieve and why.
 - Check for understanding by asking students to describe examples of projects at each level.

Presentation

- Have students share their scatter plots at the overhead projector. Discuss the various ways they entered the data into their lists.
- Have students discuss the meaning of the window settings for parametric graphing.
- Have a student demonstrate the parametric graph on the overhead.
- Have the class discuss how to graph a function in the parametric mode and the advantages of doing so.

Assessment

- Utilize the rubric to assess students’ performances.
- Allow students to assess their own work as well as that of at least one other classmate.

Extension Ideas

- Have the students devise a scenario where the race would end in a tie.
- Have students use algebraic techniques to find the distance traveled by each animal and the amount of time it would take each to reach the point of intersection. Have them compare their results to those found parametrically. Ask them to comment on which was easiest.
- Have students devise parametric equations for horizontal and vertical lines.
- Have students use parametric equations to model the motion of a projectile.

The Tortoise or the Sloth?

Student Project Card

You are probably familiar with the fable “The Tortoise and the Hare.” In it, a tortoise and a hare start from the same point and move along the same linear path.

You are the judge of a similar race in which the contestants will be a tortoise and a sloth. But instead of starting at the same points and moving along the same path, the tortoise and the sloth will start at different points and move along different paths.

The race is to be run on a track that is 1,000 meters long (east to west) and 200 meters wide (north to south). Each animal must run at a steady pace in a linear path. The sloth starts on the east side, 150 meters north of the lower left corner of the track. Each second, its position changes so it is 10 meters west and one meter south of its previous position. The tortoise begins at the bottom edge of the track, 750 meters from the lower left corner. Each second, its position changes, so it is two meters west and one meter north of its previous position.

The winner is the animal that reaches the point of intersection of the two lines first. If the race is a tie, both animals will reach the point of intersection at the same time. You must determine graphically and mathematically the winner of the race.

To complete this project you must:

1. Determine the equations of the lines in the $y = mx + b$ form for each animal and find the point of intersection or the “finish point” of the race. Record them on the *Tortoise or the Sloth* Data Collection Sheet.
2. Identify the slope of each line, applying the direction of motion for each animal, and record it on the Data Collection Sheet.
3. Use the Time and Motion table on the Data Collection Sheet to find the position of each animal for the first 10 seconds.
4. Use the calculator to create a window that corresponds to the track and make a stat plot using the data from the Time and Motion table. Record the stat plot on the Data Collection Sheet.
5. Find a formula for the position of each animal at any time, t . Make a stat plot showing both paths, and record it on the Data Collection Sheet.
6. Try various values for T_{min} , T_{max} , and T_{step} , and determine their effects on the graph. Describe these effects on the Data Collection Sheet.
7. Use the Path style to determine which animal reaches the “finish point” first. Use the Trace function to verify the point. Declare the winner of the race.
8. Verify your judgment mathematically, using parametric equations to find the time that each animal reaches the finish point. Explain your calculations.

Resources

Equation of a line websites are linked from the pages at

<http://www.tcmpub.com/urlupdates/>.

The Tortoise or the Sloth? Data Collection Sheet

1. Find the equations for the sloth's and the tortoise's paths and record them below.

Sloth: _____ Tortoise: _____

2. Describe the slope of each line in terms of the motion of the animal.

3. What is the finish point of the race? _____

4. Complete the table below for the motion of each animal over the first 10 minutes.

Time (min)	0	1	2	3	4	5	6	7	8	9	10	t
Sloth x												
Sloth y												
Tortoise x												
Tortoise y												

5. Sketch the Stat Plot for $t=0$ to $t=100$, with t increasing at increments of five minutes.

6. Sketch the parametric graph, marking the finish point.

7. What are the functions of TMin, TMax, and TStep in the window you created?

8. From the parametric graph, which animal won the race? Verify this mathematically by explaining your calculations on a separate piece of paper.

The Tortoise or the Sloth? Rubric and Scoring Sheet

Criteria	Level I (0–4 points)	Level II (5–8 points)	Level III (9–10 points)	Self Score	Peer Score	Teacher Score
Equations of Paths	You did not find the correct equation for either animal's path.	You have found the correct equation for only one animal's path.	You have found the correct equation for each animal.			
Description of Slopes	You did not correctly identify the slopes of the paths.	You correctly identified the slopes, but did not explain them in terms of the motion of the animals.	You correctly identified the slopes and explained it in terms of the motion of the animals.			
Point of Intersection	You did not find a point of intersection.	You made a computational error in finding the point of intersection.	You correctly found the point of intersection.			
Completion of Table	You did not correctly complete the table.	You completed the numerical portion of the table correctly, but did not find formulas for t .	You correctly completed the table and found formulas for t .			
Scatter Plot	You did not label the axes or indicate the scale and your points do not correspond to the data.	Your points are accurately placed, but you have forgotten to either label the axes or indicate scale.	Your points are accurately placed, and you have labeled the axes and indicated the scale.			
TMin, TMax, and TStep	You did not offer a coherent explanation.	You correctly described the purpose of TMin and TMax, but did not explain Tstep.	You gave a clear explanation of TMin, Tmax, and TStep.			
Verification of Winner	You did not identify the winner.	You correctly identified the winner, but did not verify it mathematically.	You correctly identified the winner and verified it mathematically.			
Comments:				Total Score		

Area Formulas Application (AreaForm)

Overview

- The Area Formula Application includes geometry formulas that involve area, offering both an explanation of the formulas as well as practice in using them.
- The first part consists of definitions and formulas.
- The second part consists of a 15-question quiz that gives students practice in recalling area formulas and applying them to geometry problems.

Getting Started

- Choose **Area Form** from the **APPS** menu.
- Press any key twice to continue.

Definitions and Formulas

1. Choose the first item, **DEFINITIONS & FORMULAS**.
2. Select **6: CIRCLE** from the list of six geometric figures.
3. The definition is given with three soft keys at the bottom of the screen. Choose a soft key by pressing the button directly underneath it.
4. Press the **WINDOW** key to access the **AREA** soft key to see the formula for the area of a circle.
5. Choose the **EXAMPLE** soft key to see a sample problem given using the circle formula.
6. Press the **AREA** soft key to return to the previous screen and select the **WHY?** soft key to see an animated explanation of how the circle formula is derived.
7. Continue to press the **WHY?** soft key to move through the explanation and return to the **AREA: CIRCLE** screen.
8. To return to the list of figures, choose the **MENU** soft key.
9. To exit **DEFINITIONS AND FORMULAS**, press the **MENU** soft key.

Area Formulas Application (AreaForm) *(cont.)*

Area Quiz

1. Return to the **SELECT A MODE** screen.
2. Select **2: AREA QUIZ**. Two levels are listed. **Level 1** is easier. **Level 2** creates area problems that involve more complex figures.
3. The quiz is a multiple choice, offering four choices for each question. The choices are given as soft keys at the bottom of the screen.
4. After a choice is made, there is immediate feedback as to whether or not the answer is correct. If an incorrect choice is selected, the correct answer is given.
5. The application automatically moves to the next problem. The user need not press any button to move forward.
6. After 15 questions, the final score is given. (12 points for each correct answer, thus a maximum total of 180 points.)
7. To return to the opening screen press the **MENU** soft key.

Exiting the Application

- To leave the application, choose **3: QUIT**.

Special Features

- The animated derivation of area formulas, accessed through the **WHY** soft key, is available for parallelograms, triangles, trapezoids, and circles.
- To exit a particular part of the application, press **MENU** repeatedly until the **QUIT** option appears on the screen, and then press **ENTER**.