

Time required: *45 to 60 minutes*

TI-73 Explorer™ Activity: Olympic Rings

By: Dana Dodson

Activity Overview

In this lesson, student will be introduced to programming on the TI-73. Students are introduced to the DRAW circles feature on the TI-73 by creating 3 concentric circles. The program provided requires students to manipulate the five overlapping rings placement in the coordinate plane. A brief history on the five-ringed symbol is provided.

Concepts

Students will be able to DRAW circles and edit a program, by manipulating the circles placement on the coordinate plane.

Teacher Preparation



"Olympism is a philosophy of life, exalting and combining in a balanced whole the qualities of body, will and mind. Blending sport with culture and education, Olympism seeks to create a way of life based on the joy found in effort, the educational value of good example and respect for universal fundamental ethical principles."

Olympic Charter, Fundamental principles, paragraph 2

The Olympics are coming! Whether as a spectator or competitor, students enjoy the Olympics. This lesson combines editing a TI-73 program to create the Olympic rings plus historical background on the symbolism of the five Olympic rings.

The Olympic flag was adopted in 1914 to "represent the union of the five continents and the meeting of athletes from throughout the world at the Olympic Games." [Olympic Charter, http://www.olympic.org/uk/organisation/missions/charter_uk.asp] The colors of the rings represent at least one of the colors which exist in each of the flags of the nations participating in the Olympics.

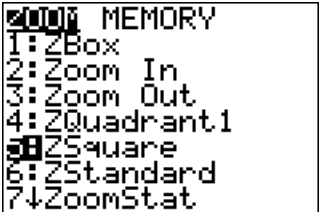
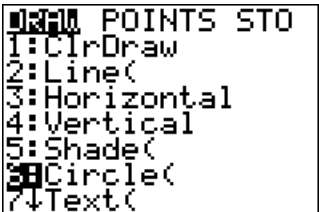
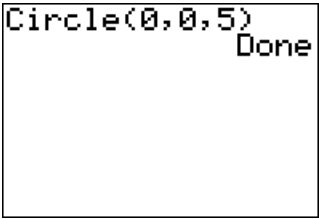
This Olympic Rings program consists of naming the program and 5 program lines representing each the 5 rings of the 5 interlocking rings on the Olympic flag. The six steps to create this program make it an excellent introduction to students on programming the TI-73.

The Classroom

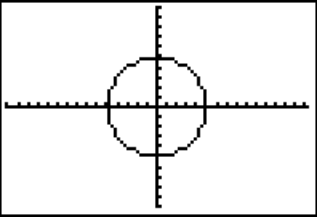
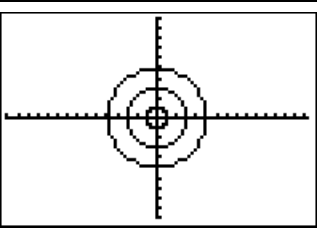
- This is an independent activity; each student will need a TI-73.
- To DRAW a circle on the TI-73 within a Program requires three pieces of information: the X and Y coordinates for the center of the circle within a coordinate plane, and the radius length of the circle.
- Have students practice with the DRAW command by creating three concentric circles.
- As some drawings become “treasures”, present the program provided as an overhead for students to save in their TI-73.
- The assignment is for the students to manipulate the X and Y coordinates of the circles until the drawing resembles the five interlocking Olympic Rings.

The Document

Step-by-step Directions for Drawing Concentric Circles

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| <ul style="list-style-type: none"> • Start with students turning off all plots and clearing all equations. The following steps can help: | <ul style="list-style-type: none"> • <code>2nd</code><code>0</code><code>6</code><code>ENTER</code>, your home screen will read “ClrAllLists” and “Done” • <code>Y=</code><code>CLEAR</code><code>CLEAR</code><code>CLEAR</code><code>CLEAR</code>, this will clear all equations. • <code>2nd</code><code>MODE</code>, this will return you to the home screen. |
| <ul style="list-style-type: none"> • Circles in the standard window setting appear oval, select <code>ZOOM</code><code>6</code><code>ENTER</code> to adjust the window settings. |  |
| <ul style="list-style-type: none"> • From the home screen, select <code>DRAW</code> and scroll down to item <code>6</code> for the Circle feature. |  |
| <ul style="list-style-type: none"> • <code>ENTER</code>, your home screen is requesting three pieces of information, or “arguments”. The first and second values are the x and y coordinates for the center of the circle. The third value is the radius of the circle. In the screen shot to the right, the circle is located at the origin (0, 0) and has a radius of 5. |  |

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| <ul style="list-style-type: none"> • ENTER, your TI-73 will take you to the graph screen and you can see your circle with radius 5 and center at the origin being drawn. |  |
| <ul style="list-style-type: none"> • Return to the home screen and repeat these steps to create two additional circles with radii of 3 and 1. | <pre>Circle(0,0,5) Done Circle(0,0,3) Done Circle(0,0,1) Done</pre> |
| <ul style="list-style-type: none"> • Your concentric circles should look like the screen shot on the right. • To clear your concentric circles, select DRAW 1 ENTER. |  |

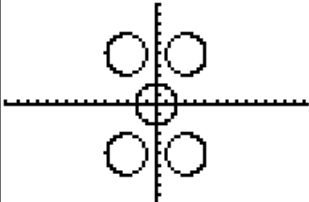
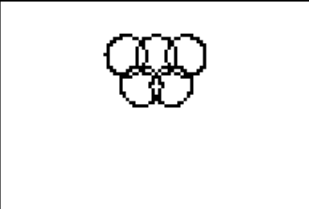
Ask your students:

- Create circles which are located in each of the four quadrants.
- If you wanted the largest circle from the above demonstration to be centered in Quadrant IV, what would be the arguments in the circle command? $[(-7,5,5)]$
- Place the circle with a radius of 3 in the II Quadrant. What are the arguments of this circle command? $[(7, -5, 3)]$

Olympic Rings Program

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| <ul style="list-style-type: none"> • Select PRGM ▶ ▶ 1 to create a new program | <pre>EXEC EDIT [NEW] [1] Create New</pre> |
| <ul style="list-style-type: none"> • This program needs a name which can only be 8 characters long. The example here is "Olyrings". To type in your program's name, select 2nd MATH and scroll to the letters for your program name. Type ENTER after each letter and "Done" when you have finished selecting all 8 characters in your program name. • Select ENTER and your program is ready for its first command. | <pre>A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [] " _ = ≠ > ≥ < ≤ and or Done OLYRINGS</pre> |

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| <ul style="list-style-type: none"> Because the Olympics Rings consist of 5 rings, all with the same radius, this program only consists of the following 5 Draw commands. <ul style="list-style-type: none"> Circle (3, 5, 2) Circle (-3, 5, 2) Circle (-3, -5, 2) Circle (3, -5, 2) Circle (0, 0, 2) | <pre>PROGRAM:OLYRINGS :Circle(3,5,2) :Circle(-3,5,2) :Circle(-3,-5,2) :Circle(3,-5,2) :Circle(0,0,2) :█</pre> |
| <ul style="list-style-type: none"> Select 2nd[MODE] and you are returned to the home screen. To view your rings, select PRGM, EXEC ENTER. |  |
| <ul style="list-style-type: none"> To remove the x- and y- axis, select 2nd[FORMAT] and scroll ▼▼▶ to AxesOff, ENTER To clear your circles, select DRAW[1] ENTER. | <pre>CoordOn CoordOff GridOff GridOn AxesOn AxesOn LabelOff LabelOn ExprOn ExprOff</pre> |
| <ul style="list-style-type: none"> It is now the students' task to determine which argument in which program line needs to be adjusted to move the 5 rings to resemble the interlocking Olympic Rings. | <pre>PROGRAM:OLYRINGS :Circle(3,5,2) :Circle(-3,5,2) :Circle(-1.5,2,2)) :Circle(1.5,2,2) :Circle(0,5,2)</pre> |
| <ul style="list-style-type: none"> A model screen shot is provided but it is not the only solution as some students might increase the size of their rings. |  |

Assessment and Evaluation

-Suggestions for assessing this activity include having students write another program using the draw feature and an image of their choice (:>o, snowman?).