



Name: \_\_\_\_\_

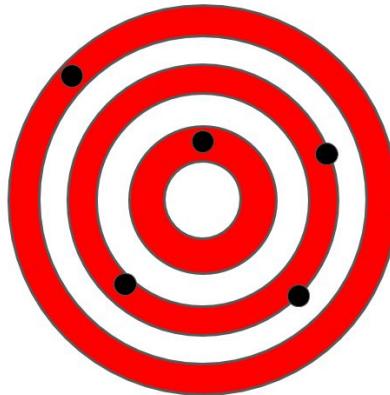
### Accuracy and Precision - Rowing Darts!

In this activity you will learn about the scientific terms accuracy and precision. In addition, you will perform a rowing activity to see how these terms apply in rowing. These two terms are usually used in relation to taking measurements.

#### Accuracy

When a measurement is taken, if the measurement is close or exactly on the actual value of the measured quantity the measurement is said to be **accurate**.

Study the following image and answer the following questions.

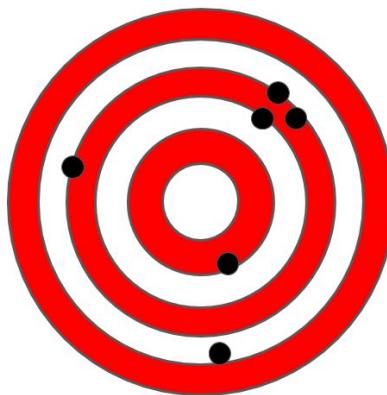


1. Which dart is the least accurate on this dart board? Label this dart by drawing a square around it.
2. Which dart is the most accurate. Label this dart by drawing a circle around it.

## Precision

When multiple measurements are taken and they are within close a range of each other, they are known as **precise** measurements.

Study the dart board below and answer the following questions.



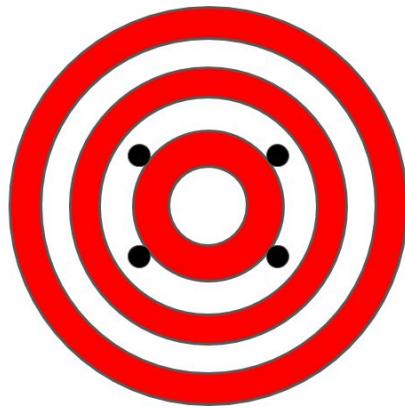
3. Put a circle around the set of darts that look the most precise to you.
4. Draw squares around those darts that are not precise.

## Precision and Accuracy

When take measurements the ideal situation is to make **precise** and **accurate** measurements.

Is it possible to make an accurate measurement without being precise? Write your response below.

Study the following image.



5. Would you say that the darts in this diagram are thrown in a precise manner?

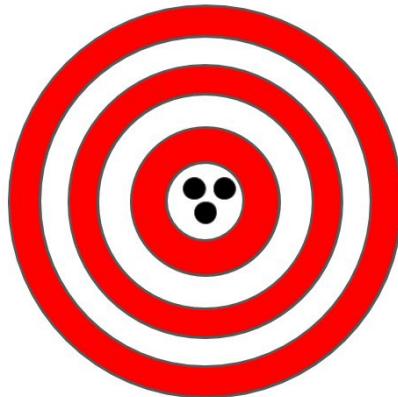
Why or why not? Explain below...

6. Is each individual dart thrown in an accurate manner?

7. Collectively (consider all of the darts together), are the darts accurate? Explain below.

8. After answering these questions, has your answer to question 4 changed?

As mentioned before, taking measurements that are accurate and precise is the most desired result! The image below represents an ideal situation.



## Rowing Activity

**Please ensure that you have had a good warm up and used a stretching routine before playing the darts game.**

In the following activity, you will complete a gain of rowing darts on the Concept 2 ergometer. In order to access the rowing game follow these instructions.

1. Press the menu button in the bottom right corner of the PM computer.
2. Press the button next to the games text.
3. Press the button next to the darts text.

You should now be ready to play the darts game. In this game it is important to be as consistent as possible so that your darts go to the center of the board. The more consistent your rowing the more darts will go to the center of the target. If you stroke (dart) is accurate and precise you will score 50 points for that dart. The other rings are worth 25, 10 and 5 points as the darts move away from the bullseye.

In the game you will have 300 darts/strokes to throw. Throwing 300 darts can take over 10 minutes to throw so it will be important to start at a pace that is sustainable for the duration of the game. Your instructor may scale this activity so that you will throw less darts, try to throw as many as possible. If you pull too hard compared to your bullseye your dart will fly above the bullseye, if don't pull hard enough your dart will fall below the bullseye.

Fill in the data table below when you have thrown all of your required darts.

<b>Number of Darts Thrown</b>	
<b>Score For Your Game (pts)</b>	
<b>Average Pace (m:ss)</b>	
<b>Total Meters Rowed (m)</b>	

9. Calculate the average number of points scored for each dart. Use the following formula.

$$\text{Score For Your Game} / \text{Number of Darts Thrown} = \text{Average Points Per Dart}$$

10. Calculate the total possible maximum score you could have obtained. Show your working in the space provided below. The formula for this is as follows:

$$\text{Number of Darts Thrown} \times 50 \text{ pts} = \text{Total Number of Possible Points}$$

11. Calculate the percentage of points your scored out of the total number of points that could have been scored. This represents how precise you were with your rowing. The formula for this is provided below.

$$(\text{Your Score} \div \text{Your total number of possible points}) \times 100 = \text{Your Accuracy and Precision Percentage}$$

**Note about your scores:** It is not important how high or low your score is. If this is the first time that you have done this activity, consider your score as a personal benchmark. It is important to work hard to improve and therefore, work hard in practice to improve your own personal score without comparing to others. Your own personal growth and improvement is what is important.

12. What was the most challenging thing about being consistent (precise) in this activity.

13. What was the most challenging thing about being accurate in this activity?

14. Devise a goal and a strategy to help you improve your rowing so that your score can improve the next time you do this activity. Write your goals and plan below.