

## ACCURACY & PRECISION

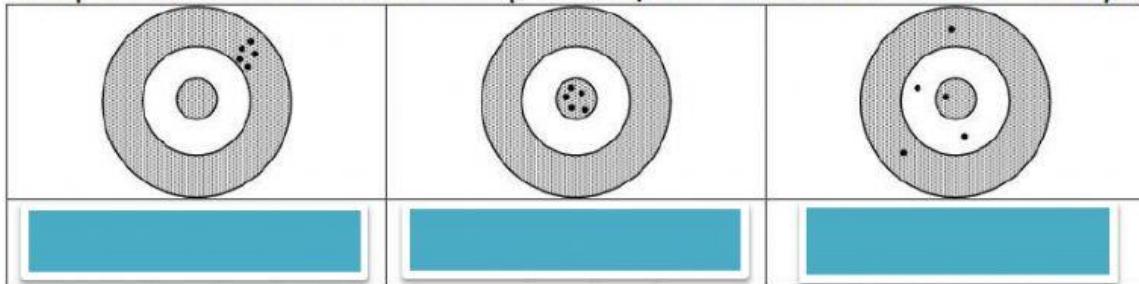
**Definitions:**

**Accuracy** - how close a measurement is to

**Precision** - how close a measurement is to

### Precision versus Accuracy:

Look at each target and decide whether the "hits" are accurate, precise, both accurate and precise, or neither accurate nor precise: (Note: An accurate "hit" is a bulls eye!)



### Precision Problems:

A group of students worked in separate teams to measure the length of an object. Here are their data:

| Team 1  | Team 2  | Team 3  | Team 4  | Team 5  | Team 6  | Team 7  |
|---------|---------|---------|---------|---------|---------|---------|
| 2.65 cm | 2.75 cm | 2.80 cm | 2.77 cm | 2.60 cm | 2.65 cm | 2.68 cm |

- The average length is  cm.  
This is the mean or average.
- Subtract the highest value from the lowest value:  cm.  
This is the range or spread.
- Divide this number by 2:  cm.  
This is the approximate  $\pm$  range from the average.
- The precision of the measurement can be shown as average  $\pm$  range.  
The precision of the measurement was   $\pm$   cm.

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A second group of students obtained the following data:

| Team 8  | Team 9  | Team 10 | Team 11 | Team 12 | Team 13 | Team 14 |
|---------|---------|---------|---------|---------|---------|---------|
| 2.60 cm | 2.70 cm | 2.80 cm | 2.75 cm | 2.65 cm | 2.62 cm | 2.78 cm |

- The average length is  cm.  
This is the mean or average.
- Subtract the highest value from the lowest value:  cm.  
This is the range or spread.
- Divide this number by 2:  cm.  
This is the approximate  $\pm$  range from the average.
- The precision of the measurement can be shown as average  $\pm$  range.  
The precision of the measurement was   $\pm$   cm.

In comparing groups, the first or the second, which group was more precise or was the precision the same? **Justify your answer.**