

Episode 3 - Measurement: The Foundation of Chemistry

1. Measurements can tell us what is in a substance and how much is there. What else must be true about these measurements?
2. Several examples were given of measurements that are made on an everyday basis. In what areas were these measurements made?
3. What is meant when we say one balance is more "sensitive" than another?
4. How do we know if an instrument such as a balance is displaying the proper value for the mass of an object?
5. What is the role of the Bureau of Standards?
6. Why are human standards (like a former King of England) not desirable?
7. What is meant by:
 - a. a titration?
 - b. a standard solution?
8. When the bay water was tested for salinity, what evidence of chemical change took place?
9. Why is it important to know the amount of pollutants, such as mercury, present in water?
10. What is spectroscopy?
11. What is meant by precision? Is it possible for measurements to be precise but inaccurate?
12. Why are repeated trials of the same measurement desirable?
13. Pollutants and trace minerals are often reported in units called ppm. What is a ppm?
14. Measurements may be made directly and indirectly. Give an example of each that you saw in the video.

Answer Key

1. Measurements can tell us what is in a substance and how much is there. What else must be true about these measurements?

They must be accurate.

2. Several examples were given of measurements that are made on an everyday basis. In what areas were these measurements made?

Gas station, hospital, industry

3. What is meant when we say one balance is more "sensitive" than another?

It can measure to more decimal places.

4. How do we know if an instrument such as a balance is displaying the proper value for the mass of an object?

A standard of known mass is used.

5. What is the role of the Bureau of Standards?

They design ways to measure and provide standards.

6. Why are human standards (like a former King of England) not desirable?

The standard would vary from king to king.

7. What is meant by:

- a. a titration?

A method for finding the concentration of a solution

- b. a standard solution?

A solution of known chemical concentration

8. When the bay water was tested for salinity, what evidence of chemical change took place?

A milky white solid formed.

9. Why is it important to know the amount of pollutants, such as mercury, present in water?

Mercury poisoning can cause neurological disorders or even death.

10. What is spectroscopy?

Determining the concentration of a solution from the intensity of its color

11. What is meant by precision? Is it possible for measurements to be precise but inaccurate?

When measurements are close to each other; Yes

12. Why are repeated trials of the same measurement desirable?

The average value is usually close to the true value.

13. Pollutants and trace minerals are often reported in units called ppm. What is a ppm?

Part per million; 1 gram in 1 million grams of material

14. Measurements may be made directly and indirectly. Give an example of each that you saw in the video.

Direct - using a balance; indirect - salinity of bay water or measuring for mercury in water