Understanding Measurement

What Is Measurement?

1. Complete the sentence:

Measurement is the process of comparing a quantity with a _____.

2. Give **two reasons** why measurement is important.

a. _____

b. _____

3. Circle the situations that involve measurement.

A. Finding the mass of a backpack
B. Saying a flower is beautiful
C. Recording the temperature of water
D. Measuring how long a race takes
E. Choosing your favourite colour

Standard or Non-Standard?

Write **S** for a standard unit and **NS** for a non-standard unit.

4. centimetre _____
5. hand span _____
6. kilogram _____
7. footsteps _____
8. second _____
9. paper clips _____

10. Why might two people get different results if they measure a classroom using their footsteps?

Choose the Best Unit

Choose an appropriate unit for each measurement.

11. Length of a pencil: _____
12. Mass of a student: _____
13. Time for a 100 m race: _____
14. Volume of water in a drinking bottle: _____
15. Distance between two cities: _____
16. Temperature of a classroom: _____

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Understanding Measurement

17. Which would be more appropriate for measuring the length of your classroom?

A. millimetres
B. metres
C. kilometres

Explain your choice:

Accuracy and Precision

Match each term with its correct meaning.

Accuracy _____ **Precision _____**

A. How close repeated measurements are to one another.

B. How close a measurement is to the correct or accepted value.

18. The actual mass of an object is **50.0 g**.

Student A: 49.7 g, 50.5 g, 50.9 g
Student B: 46.1 g, 46.0 g, 46.1 g

Which student's measurements are **more accurate**? _____

Which student's measurements are **more precise**? _____

Explain your answers:

Why Standard Units?

19. One student says a table is **7 hand spans long**. Another says it is **9 hand spans long**.

Why might their answers be different?

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20. Scientists in different countries need to compare experimental results. Why is it important that they use the same standard units?

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Understanding Measurement

What Is Measurement?

1. Complete the sentence:

Measurement is the process of comparing a quantity with a **standard or defined unit**.

2. Give **two reasons** why measurement is important.

- It allows quantities to be described accurately.
- It allows results to be compared.
- It helps people communicate information consistently.
- . It is important for science, engineering, medicine, construction, cooking, and everyday activities.

3. Circle the situations that involve measurement.
   A. Finding the mass of a backpack
   B. Saying a flower is beautiful
   C. Recording the temperature of water
   D. Measuring how long a race takes
   E. Choosing your favourite colour

Standard or Non-Standard?

Write **S** for a standard unit and **NS** for a non-standard unit.

4. centimetre S
5. hand span NS
6. kilogram S
7. footsteps NS
8. second S
9. paper clips NS

10. Why might two people get different results if they measure a classroom using their footsteps?

People's footsteps are different lengths, so different people may obtain different measurements.

Choose the Best Unit

Choose an appropriate unit for each measurement.

11. Length of a pencil — **centimetres (cm**
12. Mass of a student — **kilograms (kg)**
13. Time for a 100 m race — **seconds (s)**
14. Volume of water in a drinking bottle — **millilitres (mL)**
15. Distance between two cities — **kilometres (km)**
16. Temperature of a classroom — **degrees Celsius (°C)**

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Understanding Measurement

17. Which would be more appropriate for measuring the length of your classroom? **B. metres**

Explain your choice:

A classroom is several metres long, so metres provide a convenient and appropriate scale. Millimetres are unnecessarily small, while kilometres are much too large.

Accuracy and Precision

Match each term with its correct meaning.

Precision A. How close repeated measurements are to one another.

Accuracy B. How close a measurement is to the correct or accepted value.

18. The actual mass of an object is **50.0 g**.

Student A: 49.7 g, 50.5 g, 50.9 g
Student B: 46.1 g, 46.0 g, 46.1 g

Which student's measurements are **more accurate**? **Student A**

Which student's measurements are **more precise**? **Student B**

Explain your answers:

Student A's measurements are closer to the accepted value of 50.0 g. Student B's measurements are very close to one another, so they are highly precise, even though they are not accurate.

Why Standard Units?

19. One student says a table is **7 hand spans long**. Another says it is **9 hand spans long**.

Why might their answers be different?

Their hands may be different sizes. A hand span is a non-standard unit, so measurements made by different people may not be directly comparable.

20. Scientists in different countries need to compare experimental results. Why is it important that they use the same standard units?

Standard units allow scientists in different countries to **communicate, reproduce experiments, and compare results reliably**. For example, using SI units means that 1 metre represents the same length everywhere.

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