Know ALL of your vocabulary words!

- Accuracy (XXXiii)
- Precision (XXXiii)
- Biology (4)
- Science (11)
- Theory (11)
- Metric system (14)
- SI (14)
- Technology (glossary)
- Observation
- Inference
- Scientific method
- Hypothesis
- Serendipity
- Experiment
- Control group
- Independent variable
- Dependent variable
- Constant
- Data
- Safety symbol

2. A body of knowledge based on the study of nature is called **Science.**

3. What does biology study? **Life!**

4. List 5 key things that biologists do.

1. **Study the diversity of life**
2. **Research diseases**
3. **Develop new technologies**
4. **Improve agriculture**
5. **Help to preserve the environment**

5. (T/F) Scientists learn new information by performing investigations. **True**

6. What is another name for technology?

applied science

7. What is the scientific method?

A series of problem-solving procedures that scientists use to learn about events that occur in nature.

8. List and briefly explain the 6 steps associated with the scientific method.

1. **Observation – the process of noticing using your senses**
2. **Research - gather information related to the investigation.**
3. **Hypothesis – a possible explanation of an observation that can be tested. It is not a guess, but reasonable explanation based on research!**
4. **Experiment – tests hypothesis under controlled conditions. A good experiment tests one variable at a time, and it must be repeatable.**
5. **Analyze Data - analyze the information gained from observations/experiments.**
6. **Draw Conclusions - determine whether your data supports or does not support the hypothesis**

9. An assumption based on prior experience is called _____. **an inference**

10. List 3 necessary qualities of research. Research should be …

Reliable

Relevant

Recent

11. Is a hypothesis just a guess? Justify your answer.

No. It is testable. Based on observations.

12. List 3 essential factors of a valid experiment.

1. **Not a guess, but reasonable explanation based on research!**
2. **Predicts relationship between independent and dependent variable.**
3. **"cause-effect" relationship**

13. Compare/Contrast independent and dependent variable. Include which axis each should be plotted on.

1. **Independent Variable - you manipulate (control) and change → "cause"** x-axis
2. **Dependent Variable - changes due to the independent variable (think results) → "effect"** y-axis

14. The group that does not receive the experimental treatment and used for comparison is called the

control

15. The factor that remains fixed during an experiment while the other variables change is called the

constant

16. What is qualitative data and give two examples?

Qualitative Data – collected using your senses --> QUALITY

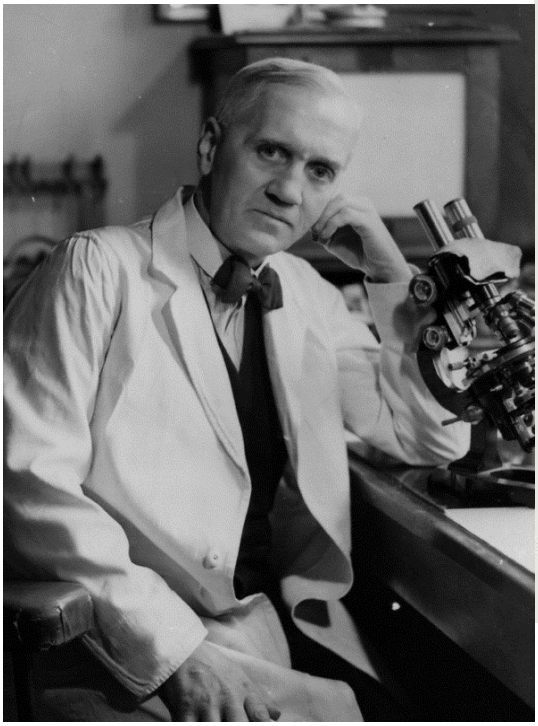
Examples: **Texture, color, shape, sound**

17. What is quantitative data and give two examples.

Quantitative Data – collected using specific tools of measurement → QUANTITY → #

Examples: **Mass, length, volume, time**

18. The occurrence of accidental or unexpected but fortunate results is called **serendipity**



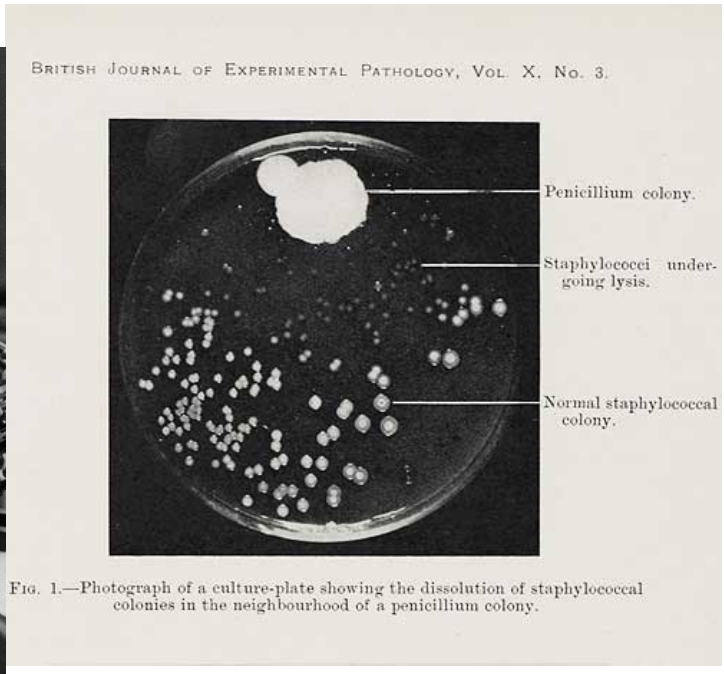


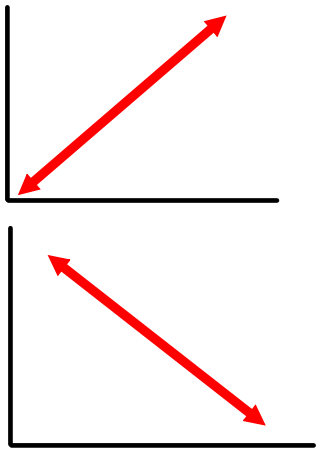
Fig. 1.—Photograph of a culture-plate showing the dissolution of staphylococcal colonies in the neighbourhood of a penicillium colony.

19. Name and explain when to use each of the 3 main types of graphs.

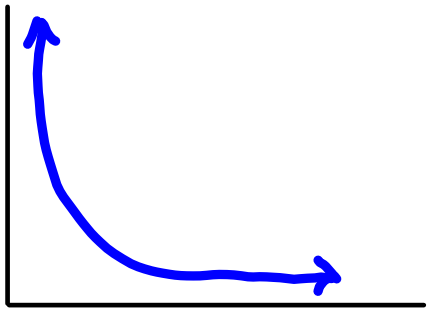
1) **Line graph – continuous quantitative (#) data**
2) **Bar graph – non-continuous data that is categorical (counting)**
3) **Circle graph – shows a relationship among parts of a whole (%)**

20. Explain direct variation and draw a graph. Explain inverse variation and draw a graph.

Direct variation **- both variables increase together or both variables decrease together**



Inverse variation **– one variable increases & one decreases**



21. (T/F) Data does not prove anything it either supports or does not support the hypothesis.

22. (T/F) Peer review allows others in the field to assess a scientist's investigations and results.

23. Compare and contrast theory and law.

Scientific Theory - explanation based on knowledge gained from many observations.
Scientific Law – 100% true statement about what happens in nature (*Principles*)

Theory	Both	Law
- Can be changed - not accepted by everyone	- explain nature, scientific phenomena - come from experimental results	- Truth - very few laws

24. **Safety Symbols**

Name and draw 3 types of safety symbols.

https://quizlet.com/88562858/lab-safety-symbols-flash-cards/

25. The metric system is based on powers of **10**.

26. Standards that are universally accepted and understood by scientists worldwide is called **SI**.

27. Know all of the metric prefixes, symbols, and values.
"King Henry Died By Drinking Chocolate Milk"

Prefix	Symbol	Conversion Factor
Kilo-	k	1000
Hecto-	h	100
Deka-	da	10
BASE (gram, meter, liter)	(g, m, L)	1
Deci-	d	.1
Centi-	c	.01
Milli-	m	.001

28. 55 m = 550 dm

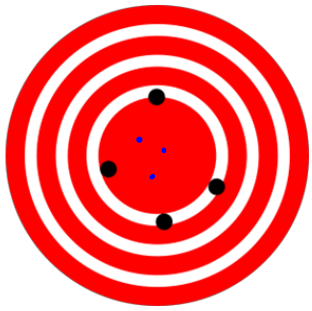
29. 19.367 kg = 1936700 cg

30. .25 mL = 0.0000025 hL

31. Compare/contrast accuracy and precision.

Precision is how close your results are to each other.

Accuracy is how close your results are to actual/ accepted results.



32. A meniscus is a curve in the surface of a liquid.

33. List 3 appropriate safety procedures.

34. List 3 inappropriate safety procedures.

35. Be able to identify lab equipment.

36. Be able to accurately record measurements using a graduated cylinder, thermometer, balance beam, and ruler.