## Unit 1: Scientific Methods and Technology

### Skills for the GED® Test
- Determine the meaning of symbols, terms and phrases as they are used in scientific presentations.
- Identify possible sources of error and alter the design of an investigation to ameliorate that error.
- Identify and refine hypotheses for scientific investigations.
- Identify the strength and weakness of one or more scientific investigations.
- Design a scientific investigation.
- Reconcile multiple findings, conclusions or theories.
- Understand various charts, graphs, and tables.

### Skills for the HiSET™ Test
- Follow precisely a complex multistep procedure when carrying out experiments, taking measurements or performing technical tasks, attending to special cases or exceptions defined in the text.
- Understand how to read charts, graphs, and charts.

### Tips
- When studying Unit 1 Lesson 1 and 2, it is critical to understand the key terms and processes of scientific thinking in order to apply these ideas to different assessment questions.
- Lesson 3 will introduce you to many different graphs and charts. Understanding how to read these will help in the Science and Math portions of the GED® Test.

- When preparing for this assessment, practice reading scientific text as it applies to scientific thinking and experiments in order to answer assessment questions.
- Lesson 3 will introduce you to many different graphs and charts. Understanding how to read these will help in the Science and Math portions of the HiSET™ Test.
Lesson 1: Science as Inquiry

This lesson covers the following information:
- The scientific method
- The scientific method applied to real world situations
- Reading science based text

Highlights include the following:
- When reading scientific text, the questions and concepts that guide scientific investigations are the main ideas.
  - Questions to ask when reading scientific passages include…
    - What scientific questions does the passage reinforce?
    - What scientific questions is the paragraph looking to answer?
- Scientists use a series, or process of steps, to answer the questions they ask using a process called the scientific method.
  - Posing a question.
  - Forming a hypothesis.
  - Testing the hypothesis by means of a controlled experiment.
  - Recording and analyzing the data.
  - Drawing a conclusion as to whether the data supports the hypothesis.
  - Repeating the work.
- Scientists will have two groups. One is a control group that always stays the same. The other group is the experimental group. Having two groups allows scientist to compare the results and draw appropriate conclusions.
- Scientists may use pie charts, bar or line graphs, and other types of charts to organize and display their results.

Reflection:
- A hypothesis is an educated guess that can be supported or disproved through observation or experimentation.
• Science is not based on opinion, but on actual facts discovered through inquiry, observation, and experimentation.

Notes:
Crossword Puzzle:

Across
3. A statement that can be proved true.
4. Information gathered from research.
9. The problem or question that needs to be analyzed through investigation.

Down
1. An educated guess that can be disproved or supported through experimentation and/or observation. It is a reasonable explanation of some scientific fact or observation.
2. A factor that can change the results of an experiment.
5. A group of hypotheses that has withstood the test of time and is therefore a powerful concept that helps scientists make dependable predictions about the world.
7. A belief that cannot be proved or disproved.
8. A condition or measure that is held constant to ensure that it is not the cause of changes.
Lesson 2: Science and Technology

This lesson covers the following information:

- DNA
- Using DNA to advance scientific research

Highlights include the following:

- DNA is the code that gave you your hair color, eye color, height, weight, and even your personality to some degree.
- Comparing DNA is called DNA typing.
- DNA is in all living things.
- The strands of DNA are grouped into structures called chromosomes.
- Cloning is copying one organism and creating an exact genetic copy.
- Reproduction by cloning is known as asexual reproduction.
- As science and technology continue to evolve, the questions generated with testing a hypothesis are also parallel with moral and ethical concerns.

Reflection:

- Scientists, researchers, doctors, and individuals from every walk of life have access to more information at a faster rate than in any time in history.
- This access to information, and understanding DNA and the possibilities with cloning has led to moral and ethical questions.

Notes:
### Word Search:

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Lesson 3 Charts and Graphs in Science.

This lesson covers the following information…
- Different types of graphics
- Techniques used when reading graphics

Highlights include the following:
- Graphics are very useful in communicating information but they need to be read differently than reading a text or a novel.
- Many graphs are based on coordinate planes.
- Graphs can be used to visually represent the data.
- A bar graph is a visual image that uses horizontal or vertical bars to show and compare quantities.
- A histogram shows data using columns plotted on a chart.
- Bar graphs illustrate date from different categories.
- Histograms represent data from one category and are used to get an overall picture of data points so trends can be identified.
- A circle graph is a visual image that compares a set of data with each other and the whole set where each part represents a percentage of the whole.
- A line graph is a visual image that shows a series of data points connected by straight-line segments.
- Line graphs are on a coordinate grid plane with designated values corresponding to locations on the horizontal and vertical axes.
- The box plot graph is a graph of statistical data based on the minimum, first quartile, median, third quartile, and maximum.
- When data is represented by a large number of ordered pairs, a scatter plot is used. A scatter plot is a set of points plotted in a coordinate plane with 2 axes. Once plotted on the coordinate plane, any correlations or patterns in the data can be observed.

Reflection
Bar graphs use horizontal or vertical bars to show and compare quantities. Box plots are based on the minimum, first quartile, median, third quartile, and maximum. Circle graphs compare a set of data with each other and the whole set. Histograms display statistical data and line graphs show a series of data points connected by straight-line segments.
Cryptogram

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