

Name: _____

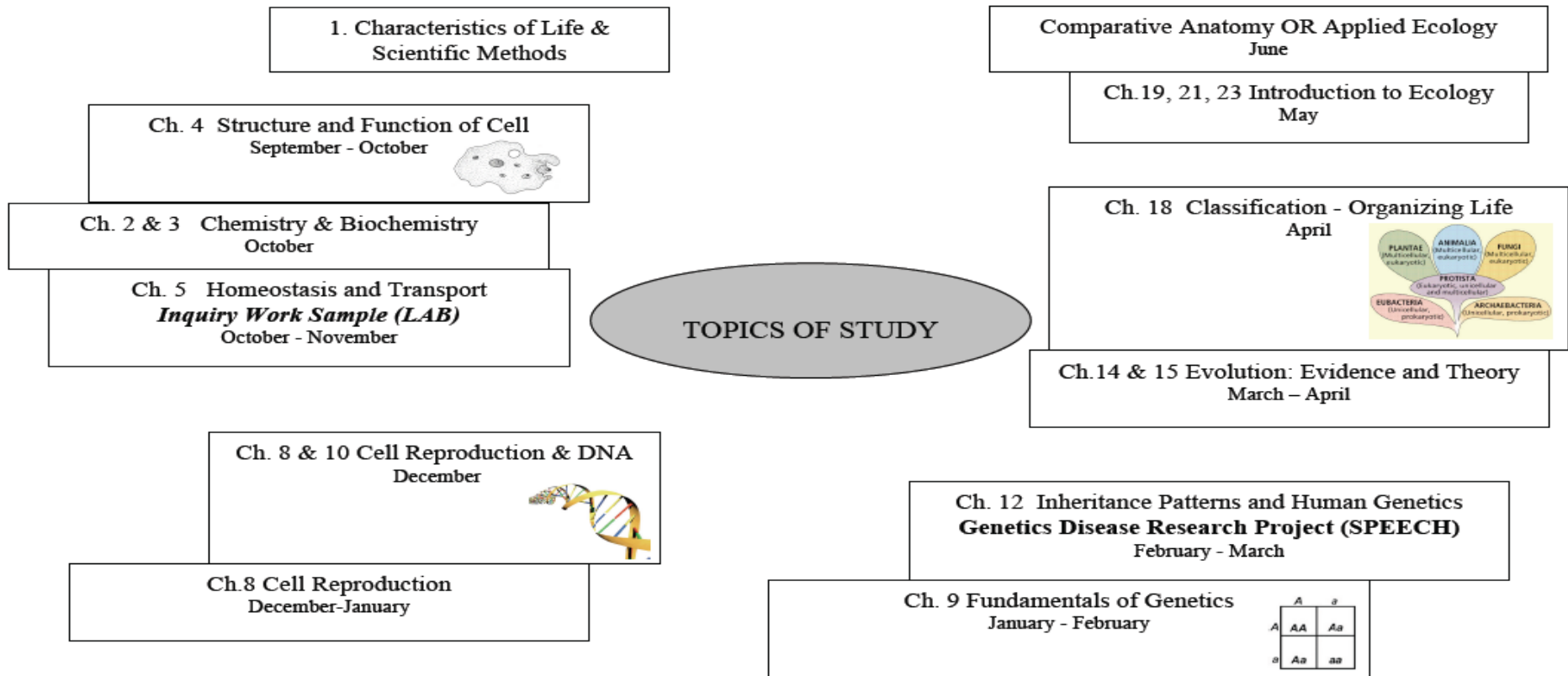
Block: _____

Introduction to Biology			
Purpose: This unit will provide an introduction biology, safe laboratory procedures, and what constitutes something as alive			
Date	Topics/Activities	Objectives	HW Due
9/7 & 9/8	<ul style="list-style-type: none"> • Get to know teacher & classmates • What is biology? • What makes something alive? • Characteristics of Life Lab 	Explain what makes something alive & identify characteristics of life	
9/9 & 9/12	<ul style="list-style-type: none"> • Syllabus & Review Standards Based Assessments • Community Agreement • Book checkout • Cells Pre-Test • Safety Scenarios & Procedures 	Define proficiency based assessment Demonstrate proper laboratory safety procedures and behavior	<i>Read Syllabus</i>
9/13 & 9/14	<ul style="list-style-type: none"> • Scientific Method: Manipulating Plant Growth Lab • Class Expectations Quiz 	Identify independent, dependent variables, control, constants Assess classroom expectations and procedures	<i>1.3 Review & Study Guide</i> <i>Signed Syllabus & Safety contract</i>

Next Unit: Cells

Advanced Biology Course Map

Biology is taught using a variety of teaching and learning strategies to help students acquire knowledge about life and apply this knowledge to their lives. This knowledge can be used to solve complex challenges, improve one's health and the environment, and develop an appreciation for life's unending connections and complexity.



Biology Course Organizer

2011-2012

<p>Biology examines how living things stay alive, grow, reproduce, use energy, change over time, and interact with each other and the environment.</p>	<p>Contact Information Dan Rott Room 34 drott@ttsd.k12.or.us 503-431-5272</p>
<p style="text-align: center;">Biology Content Standards</p> <ol style="list-style-type: none"> 1. Distinguish between prokaryotic and eukaryotic cells, and plant and animal cells. 2. Describe how eukaryotic cells create and use energy 3. Identify examples from the history of science that illustrate modification of scientific knowledge in light of challenges to prevailing explanations 4. Describe the structure and behavior of the cell membrane. 5. Describe and explain how passive transport maintains homeostasis and life. 6. Describe and explain how active transport maintains homeostasis and life. 7. Explain how the carbon atom and water are important to all life. 8. Identify characteristics and examples of proteins, lipids, and carbs. 9. Describe the structure of DNA and how proteins are formed from this code. 10. Explain the processes and enzymes that lead to the creation of proteins. 11. Describe the outcome of the cell cycle (interphase and mitosis). 12. Identify, explain, and apply Mendelian genetics including laws, simple heredity, and use of Punnett Squares. 13. Identify and explain complex patterns of inheritance including interpreting pedigrees. 14. Explain how genetic diversity is increased with crossing over, mutations, and genetic recombination. 15. Explain how our understanding of biological evolution has changed over time. 16. Classify types of evidence for biological evolution. 17. Explain and state how old the earth is and the evidence for it. 18. Identify and explain different aspects that contribute to biological evolution 19. Describe, explain, and analyze the relationships between biotic and abiotic parts in an ecosystem. 20. Predict the outcomes of a change in resources and energy to an ecosystem. 21. Describe how energy and chemicals (nitrogen, carbon, water, & phosphorous) pass through different levels in the ecosystem. 22. Describe, explain, and analyze how ecosystems change in response to disturbances and interactions (climate change, habitat destruction, natural and human causes of change, loss of species and introduction of new species). 	<p>Materials & Supplies</p> <ul style="list-style-type: none"> • <i>Holt Biology</i> • Three-ring binder • Spiral notebook • #2 pencils and blue/black pens • Planner • Calculator • Colored pencils <p>Grading Students must meet proficiency for all unit standards in order to pass the semester. Final grades will be determined based on the culmination of student work for all unit and career related learning standards</p>
<p style="text-align: center;">Career-Related Learning Standards (CRLS)</p> <ol style="list-style-type: none"> 1. Communication 2. Teamwork 3. Work Ethic 4. Data Collection & Analysis 5. Application of Science 6. Scientific Planning 	<p>Tualatin Community Principles</p> <ul style="list-style-type: none"> ➤ <i>Responsible</i> ➤ <i>Respectful</i> ➤ <i>Safe</i>

Warm-Ups

Date:

Date:

Date:

Date:

Student Survey: *Get to know you*

Name _____ Block _____

Your Interests

List five things you enjoy doing when you are not at school? (sports, art, dancing, t.v.)

- 1.
- 2.
- 3.
- 4.
- 5.

What are two things about you that might surprise people? (Hidden talents,

- 1.
- 2.

Do you enjoy working with technology (computers, gadgets, MP3 players)?

What is your favorite music and movie?

Your Life

Have you lived somewhere other than the Tualatin area? _____ Where?

Do you have siblings? _____ If so, how old are they?

Give three things you want to have done or be doing in five years?

- 1.
- 2.
- 3.

How have you been working towards these goals? (Example: I am training for a marathon, I'm planning to be certified to scuba dive by next summer, or I may purchase Rosetta Stone to learn a second language.)

Do you help care for a family member? (Feel free to write more than yes or no.)

Do you work after or during school? _____ If so, where? _____

Do you have computer AND internet access at home?

You & Science

What **science** classes have you **most enjoyed**?

What are some ways you learn best? (Lecture, discussion, reading, laboratory, writing, ect.)

Are there areas of science or biology you think you dislike, and if so, why?

What middle school did you attend: ***Twality*** ***Hazelbrook*** ***Other***

1. 2. 3.

Do you consider yourself a good student? Why or why not?

What has been your MOST favorite part of school?

What has been your least favorite part of school and why?

Student Survey: Get to know your group

Wait for instructions before proceeding to next activity

Your Life Story

Share your life story, in 6 and only 6 words. **Mr. Rott's example: I travel with my two sisters.**

- 1.
 - 2.
 - 3.
 - 4.
 - 5.
 - 6.
-

Your Similarities

Find as many similarities between your group members as possible (You must all share the similarity). Write them below.

Your Interests

If your group was to look at a social network page designed by you (Facebook/Myspace), what are three things you would like them to know?

- 1.
 - 2.
 - 3.
-

Student Survey: Get to know your class

Think of three facts about yourself that you would like to share with the class. Memorize these facts.

Mr. Rott's Examples: My name is Dan Rott, I have two sisters, I love sushi.

- 1.
- 2.
- 3.

Characteristics of Life Lab

Name: _____ Date: _____

Background: Scientists have generally agreed as to what characteristics something must display to be considered alive. To understand this, think about why we consider rocks or computers not alive.

Procedure: Visit the seven lab stations, each representing different characteristics of life in the clues and objects provided. Describe the items, or what they have in common, then state the characteristic of life it represents. Some stations provide clues through analogies, while others directly illustrate the characteristic.

- Characteristic Bank:
- Life is made of cells.
Life grows and develops.
Life adapts to changes.

Life uses energy.
Life reproduces.

Life is organized
Life responds to stimuli.

Description of Items	Characteristics of Life
Station 1	
Station 2	
Station 3	
Station 4	
Station 5	
Station 6	
Station 7	

2. State and describe another object that could represent one of the characteristics of life.

Name _____

Period _____

Date _____

SECTION

1.3

SCIENTIFIC THINKING AND PROCESSES

Study Guide

KEY CONCEPT

Science is a way of thinking, questioning, and gathering evidence.

VOCABULARY

observation	hypothesis	independent variable	constant
data	experiment	dependent variable	theory

MAIN IDEA: Like all science, biology is a process of inquiry.

Complete the table below by giving a brief description and a brief example of each of the scientific process terms.

Scientific Process	Description	Example
Observation	1.	2.
Data	3.	4.
Hypothesis	5.	6.

7. How do scientists use statistics when they test a hypothesis?

8. Why is it important that a scientist's results are evaluated by other scientists?

Name _____

Period _____

Date _____

STUDY GUIDE, CONTINUED

9. Look at Figure 1.10. Beginning with observation, what are the five parts of scientific thinking?

MAIN IDEA: Biologists use experiments to test hypotheses.

10. In _____ studies, scientists do not interfere with what is going on.
11. Scientists can test hypotheses through _____.
12. A(n) _____ variable is one which is observed and not manipulated by the scientist.
13. How are constants different from independent variables?

MAIN IDEA: A theory explains a wide range of observations.

14. What is the difference between a theory and a hypothesis?

15. Why are theories never proven?

Vocabulary Check

16. What is a hypothesis?

17. How can you remember the difference between an independent variable and a dependent variable? Think about what the words *independent* and *dependent* mean.

Name _____

Period _____

Date _____

CHAPTER 1 OPTIONS FOR INQUIRY—DESIGN YOUR OWN

1 Manipulating Plant Growth

The direction in which plants grow is affected by conditions such as light, gravity, and contact with an object. In this lab, you will design your own experiment to determine how changing an independent variable affects a dependent variable.

Problem

How does changing an external condition affect plant growth?

Procedure

- 1 Label three bean plants A, B, and C.
- 2 Decide which condition you will test: light, gravity, or contact with an object.
- 3 Design your experiment and identify your independent variable. Use one plant as the control condition. Use the other two plants as experimental conditions. For example, gravity can be tested by placing an experimental plant on its side.
- 4 Identify the constants in your experiment, such as the amount of water you will give the plants.
- 5 Determine the operational definition for the dependent variable; that is, decide how you will measure the dependent variable. For example, it could be the number of leaves facing in a certain direction each day.
- 6 Record your observations once a day for five days in the table below. Remember to wash your hands after handling the plant.

**MATERIALS**

- 3 bean plants
- 10 cm masking tape
- permanent marker
- light source
- 3 wooden sticks
- 1m string
- metric ruler
- water
- 250-mL beaker

PROCESS SKILLS

- Designing Experiments
- Observing
- Collecting Data
- Analyzing Data
- Inferring

TABLE 1. EFFECT OF _____ ON PLANT GROWTH

Day	Plant A Growth (mm)	Plant B Growth (mm)	Plant C Growth (mm)
1			
2			
3			
4			
5			

- 7 Have your teacher approve your procedure. Carry out your experiment.

Name _____

Period _____

Date _____

Analyze and Conclude

1. **Analyze** How did your independent variable affect plant growth? How did you measure the dependent variable? Do the data support your hypothesis? Explain.

2. **Infer** Why is it important to have control groups and constants in an experiment?

3. **Communicate** Share your results with other groups. How did different independent variables affect plant growth? Did your results agree with the results of other groups that tested the same variable? If not, what might have caused that difference?

4. **Design Experiments** Review the design of your experiment. What changes could you make to the procedure to reduce the variability in your data?

5. **Ask Questions** From your data, what new questions do you have about plant growth?

LAB ASSESSMENT RUBRIC:

	Not Proficient	Proficient	Exceeds Proficiency
Scientific Planning:	Missing some elements of proficient - please correct and turn back in within one class period.	Includes most of the following <i>Hypothesis & Variables:</i> <ul style="list-style-type: none"> • Testable question or hypothesis • IV & DV • CONTROL • 1 appropriate constant listed <i>Procedure:</i> <ul style="list-style-type: none"> • Repeatable numbered steps that are clear 	Meets plus most of the following <i>Hypothesis & Variables:</i> <ul style="list-style-type: none"> • Background illustrates the context of the lab • Several appropriate constants listed. <i>Procedure:</i> <ul style="list-style-type: none"> • Detailed and concise
Data Collection & Analysis:	Missing some elements of proficient - please correct and turn back in within one class period.	Includes most of the following <i>Data Analysis and Conclusion:</i> <ul style="list-style-type: none"> • Type of graph and/or table is appropriate for data • Labeling of graph or table is correct (axis, units, and title) • Conclusion addresses original question or hypothesis using data 	Includes most of the following <i>Data Analysis and Conclusion:</i> <ul style="list-style-type: none"> • Calculations are used when appropriate (mode, average, error) • Conclusion discusses limitations and errors (individual and procedural) and suggestions are made to improve and correct lab • Applies data and conclusions to other class content or real life examples by using additional research
Work Ethic:	Missing elements listed in proficient AND/ OR JEOPARDIZES SAFETY.	Includes most of the following: <ul style="list-style-type: none"> • Student is on task and works consistently to complete lab during class period • Student leaves lab area clean and prepared for next class 	Includes most of the following: <ul style="list-style-type: none"> • Student helps to clean common areas OR student assists other students when appropriate OR student utilizes time to pursue

Teamwork:	Missing elements listed in proficient.	Includes most of the following: <ul style="list-style-type: none"> • Works with group members by remaining positive • Does not distract others • Positively contributes to the group's lab completion 	Includes most of the following: <ul style="list-style-type: none"> • Student assists other group members as necessary
Communication:	Missing elements listed in proficient.	Includes most of the following: <ul style="list-style-type: none"> • Answers fully address question • Limited grammatical errors and conventions • Uses scientific language (avoid the use of pronouns like I, you, me, we, our, etc.) and is concise but detailed 	Includes most of the following: <ul style="list-style-type: none"> • Discussion fully connects findings or implications to class concepts or real world events. • Appropriate scientific vocabulary used extensively and accurately