

Lesson Title: Understanding Growth and Development of Organisms Through Butterfly Metamorphosis

Target Grade: 7th

Over Arching Goal: Through didactic and hands-on activities, students will gain an immersive understanding of butterfly metamorphosis.

Essential Questions:

1. How will an immersive look into the butterfly life cycle and reproduction provide a better understanding of organism reproduction, characteristics, and behaviors?

Types of Learning:

1. Cognitive: Students will build upon previously learned knowledge of life cycles, reproduction, and development of organisms providing both a deeper and broader understanding of the growth and development of organisms in the world around them.

Objective:

- 1.) By viewing the Marine Biological Laboratory's Metamorphosis video and accompanying PowerPoint slides, students will gain knowledge of the butterfly life cycle and the differences between complete and incomplete metamorphosis. By creating a Piktochart printable poster <http://piktochart.com/> students will be able to demonstrate their newly gained knowledge of differentiating life cycles and complete versus incomplete metamorphosis.
- 2.) With knowledge gained from the video and slides, students will be able to create 3D visual models of the stages of the butterfly life cycle, then describe (written or auditory) the characteristics of the organism and its life cycle.

Next Generation Science Standards Addressed:

Objective 1: By viewing the Marine Biological Laboratory's Metamorphosis video and accompanying PowerPoint slides, students will gain knowledge of the butterfly life cycle and the differences between complete and incomplete metamorphosis. By creating a Piktochart printable poster <http://piktochart.com/> students will be able to demonstrate their newly gained knowledge by differentiating of life cycles and complete versus incomplete metamorphosis.

Materials:

1. Student access to computer/internet
2. MBL video
3. MBL slides
4. Video tutorial on how to sign up for free registration with Piktochart.com (Piktochart is often used in 7th grade social studies classes when creating presentations on countries population, economic status, etc.).
5. Video tutorial and visual example of Piktochart and rubric of information that is expected on the students Piktochart.
6. Instructions on how students should submit their assignments.

6. Provide an email address or other contact information where students should submit their assignment and assignment date

Lesson 1:

1. Pre- Assessment:

- a. Pre-Assessment Kahoot <https://kahoot.com/>– This assessment can be done with students to assess their previous knowledge on the life cycle of a butterfly. It will also provide an introduction of new vocabulary terms from this lesson (Note: the same Kahoot pre-assessment should be given at the end of the lesson to assess learning <https://create.kahoot.it/details/1a64f247-ac6b-4e0f-972b-b992497e8151>).
- b. From Quizizz.com. Metamorphosis and Animal Life processes
-<https://quizizz.com/admin/quiz/5c38b0a303af38001af77119/metamorphosis>
-<https://quizizz.com/admin/quiz/5aceb6e66464770019ed3967/animal-life-processes>
- c. From Study.com
-<https://study.com/academy/practice/quiz-worksheet-metamorphosis.html>

2. Interactive Information sheets to assist students:

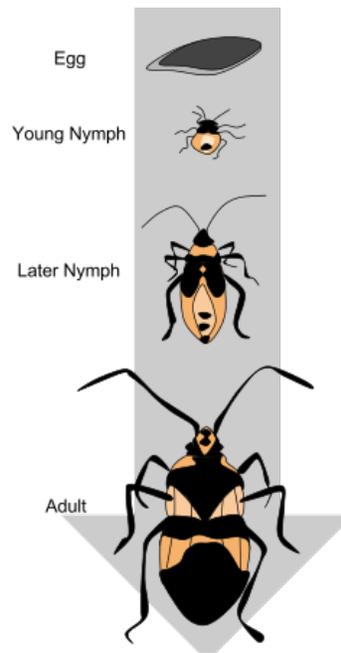
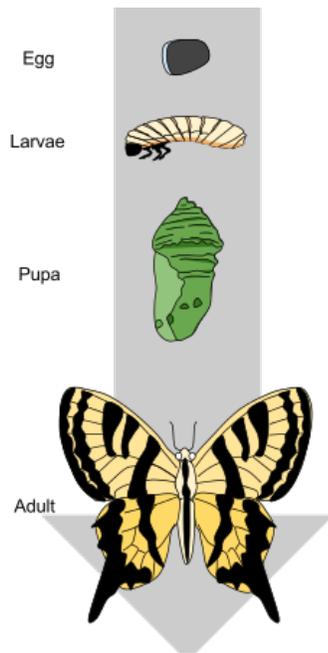
- <https://community-portal-prod-previewdata.s3.us-west-2.amazonaws.com/files/2020/07/ec0b74a68f52c59561e0/index.html>
- <https://lsintspl3.wgbh.org/en-us/lesson/Nat36-Butterfly/2>

3. Worksheet: Students will complete the following worksheet and use it as a reference for their Piktochart poster presentation.

- b) Butterfly eggs hatch into small larva known as _____.
- c) The pupa of a butterfly is called _____.

Section 2: Complete and Incomplete Metamorphosis

1. Name the type of metamorphosis pictured in the below diagrams



2. Describe the difference between these types of metamorphosis (please use complete sentences and describe each stage of each type of metamorphosis):

4. Creating Piktochart on Butterfly Life Cycle

1. Introduction to Piktochart-<https://www.youtube.com/watch?v=MMY-t-JKv5k>

- a. Piktochart examples for students to look at (in the E-book these can be pages so students can really look at them)



2. Piktochart Rubric

Task Description: Design an Infographic Poster on the Life Cycle of the Butterfly. Include the following information.					
		<ul style="list-style-type: none"> • Stages of the Butterfly Life Cycle • Reproduction • Sexual Reproduction 	<ul style="list-style-type: none"> • Complete Metamorphosis • Incomplete Metamorphosis 		
Criteria	Weight	Master	Meets	Developing	Does not meet
Content	50%	<ul style="list-style-type: none"> ◆ Appropriate details support main idea ◆ Accurate and detailed information ◆ Information adequately supports purpose of visual 	<ul style="list-style-type: none"> ◆ Most details support main idea ◆ Accurate information for almost all subject matter ◆ Information is mostly adequate and supportive of visual's purpose 	<ul style="list-style-type: none"> ◆ Some details support main idea ◆ Accurate information for some of the subject matter 	<ul style="list-style-type: none"> ◆ Details are inaccurate and do not support the main idea
Focus	20%				
Visual Appeal	20%				
Mechanics	10%				