Biology EOC

- Must pass EOC to graduate from high school
  - Performance Level Descriptors
    - Basic, Proficient, or Advanced
    - To pass, need a level 3 or 4
  - Scale scores (below) – on your transcript it simply states "Met" or "Not Met" – no score

Science EOC	Level 1	Level 2	Level 3	Level 4
Biology	275-374	375-399	400-422	423-525

Scenarios and Items

- Scenarios provide context for sets of items.
  - Three categories of scenarios:
    - **Systems** – overview of a specific system
    - **Inquiry** – a controlled experiment or field study
    - **Application** – the technological design process
- Items not connected to a scenario are called "Stand Alone" items.

Test Specs

- **Multiple Choice** (31-34)
  - Each has four choices, 1 correct & 3 distractors
- **Completion** (1-4)
  - Requires you to write a number, word, or short phrase
- **Short Answer** (5)
  - Response in phrases or sentences
  - May include writing a conclusion or procedure, solve a technological design problem, or describe aspects of biological systems
- **Pilot Items** (5)
  - Not part of your score (trying them out for future use)

Item Type	**Biology EOC**
Multiple Choice	30-34
Completion	1-5
Short Answer	5
Total Items	**40**
Total Points	**45**
Pilot Items	5

Question Distribution - Content

Life Science Domain of EALR 4	Percent of EALR 4 Items	Percent of EOC Points
Processes in cells (LS1)	40-45	20-23
Maintenance and stability of populations (LS2)	30-35	15-18
Mechanisms of Evolution (LS3)	25-30	14-16

Short Answer

- **Inquiry Items**
  - Conclusion
  - New Procedure
  - New Field Study
- **Application Items**
  - Research & Explore
  - Redesign
  - Criteria & Constraints
  - Test Solution
  - Unintended consequences

Lessons Learned

- In general, students often fail to earn points because of
  - **incomplete responses** or
  - **vague responses**.

- There is **no penalty for guessing** on multiple choice items! AND
- **Partial credit** can be earned on short-answer items!

- Stop here!
- Have students take a sample test from 2013
- Go over answers

Answers to the test

- 1) C
- 2) C
- 3) CCG-GUA
- 4) A
- 5)A
- 6) D
- 7)D

Question #8

- 2 point response describes 2 possible unintended consequences by describing:
  - 2 effects and
  - How each effect causes a change in another part of the ecosystem

Example Responses for #8

Examples:

Effect on a part of the forest ecosystem:	**Change in another part of the forest ecosystem:**
Water is polluted/Insecticide gets into water	*Fewer/harms fish/aquatic insects/aquatic plants*
Air is polluted	*Fewer insects/birds*
Other insects die	*Less food for birds*
Other plants die	*Less food for other animals or insects*
Less food for birds	*Predators of the birds decrease in population*
Biomagnification/Builds up in food chain	*Kills/harms predators*
Increase in forest fires	*Animals lose habitat/harm to people/animals*
Decrease in the biodiversity of plants in the ecosystem	*Some animals would lose their plant food source*

A 2 point response to #8

One unintended consequence:
All of the moths will die or have the poison on them and get into the water supply.
That will pollute the water and kill the animals that drink it.
Another unintended consequence:
All the moths will be gone and no more will be reproduced. This means that the
birds will die because their food source will be gone.

A 1 point response

One unintended consequence:
One unintended consequence is that the birds or other animals will lose their food
causing a chain reaction in the food chain.
Another unintended consequence:
Second if a bird eats a moth that is infected with the insecticides it will cause
biological magnification through the food chain until the parts per million is
deadly for the apex preditor

A 0 point Response to #8

One unintended consequence:
The insecticides could kill the tree and other insects.
Another unintended consequence:
The insecticides could get into the water and pollute the water.

Answers

- 9) D
- 10) C

Stream Answers

- 11) A
- 12) A
- 13) D
- 14) B
- 15) B
- 16) C

A 2 point response for #17

Field Study Question: How does water depth affect the temperature of water in a stream?
Procedure:
1. *Record the temperature and weather conditions.*
2. *Measure the depth of the stream.*
3. *Place a thermometer on the surface of the stream.*
4. *Record the temperature.*
5. *Wait 5 minutes.*
6. *Repeat 3-5 for trials 2 and 3, placing the thermometer at the same spot.*
7. *Repeat steps 3-6 for half the depth of the stream and full depth of the stream.*
8. *Calculate the average temperature for each depth.*

Attributes of a Procedure	Credit	Annotation
Method for Collecting Data (Controlled Variable)	1	*5. Wait 5 minutes.* **OR**... *6. ...placing thermometer at the same spot.*
Conditions to be Compared (Independent Variable)	1	3 conditions: *3.... on the surface of the stream...* *7....for half the depth of the stream and full depth of the stream.*
Data to be Collected (Dependent Variable)	1	*4. Record the temperature.*
Record Measurements	1	*4. Record the temperature.*
Observations are Repeated	1	*6. Repeat steps 3-5 for trials 2 and 3...* *7. Repeat steps 3-6...*
Record Environmental Conditions	1	*1. Record the temperature and weather conditions.*
Logical Steps	1	The steps of the procedure are detailed enough to repeat the procedure effectively.
Total Attributes	7	**2** Score Points

A 1 Point Response

Field Study Question: How does water depth affect the temperature of
water in a stream?
Procedure:
1) measure different depths of the stream (3ft, 5ft, 10ft).
2) collect data by checking the temperature of the different depts in the stream 3 different
days.
3) record data found in a chart w/all 3 thats taken.
4) compare data and make a conclusion to tell how water dept affects the temperature of
the water in the stream.

Attribute Name	Credit	Annotation
Method for Collecting Data (Controlled Variable)	0	None
Conditions to be Compared (Independent Variable)	1	3 conditions: *1)…different depths of the stream (3ft, 5ft, 10ft).*
Data to be Collected (Dependent Variable)	1	*2) …checking the temperature of the different depts…*
Record Measurements	1	*3) record data found in a chart…*(Clarified by step 2)
Observations are Repeated	1	*2) …collect data by checking the temperature…3 different days.*
Record Environmental Conditions	0	None
Logical Steps	1	The steps of the procedure are detailed enough to repeat the procedure effectively
Total Attributes	**5**	**1** Score Point

A 0 Point Response

- This is a prediction rather than a procedure

Field Study Question: How does water depth affect the temperature of
water in a stream?
Procedure:
The water closest to the top is usually warmer than near the bottom of the stream.
In that case, you'd find the temperature of the water at the top then at the bottom of the
stream. The time of year when being measured would also matter. It would be colder in the
winter then in the summer, meaning you should check every season. You'd have to use an
accurate thermometer. If it's raining, the water will be colder than it would be if it was
sunny, which would play a role in the scenario.

Criteria and Constraints--Examples of Possible Answers

Identify constraint	**Describe how the constraint is a limitation**
...other animals besides the bears might get trapped.	• *...the other animals are not a problem and might get hurt.* • *...the traps will contain the other animal and the bears don't get trapped*
...places for the problem bears might be far away	• *Lots of fuel/time/people will be needed to move the bears*
...the bears may be violent	• *Ranger will need lots of protective gear/special training*
...the traps might hurt the bears.	• *...people will protest the use of the traps/try to prevent the traps*

Research and Explore—A 2 point Response

Problem: Increase the population of worms in the soil
Research the Problem:
What kind of worms are in the soil? Collect worms and ask science teacher what nutrients they need.
What is the best temperature? How much water is good for worms? Google worm environment
Explore Ideas:
Cover with black plastic to increase temperature. Count worms before and after putting down plastic
Add compost to the soil as food for worms

Research and Explore

Attributes of a Scientific Design Process

Design Process Stage	Description	Attributes
Research the Problem	Information needed to solve the problem is described or pertinent questions are given (e.g., *what type of soil do worms survive in, how much water do worms need, find out how long worms live*). Stage Notes: 1. Listing objects given in the prompt or scenario cannot be credited. 2. Repeating an appropriate process from the scenario can be credited.	1
Scientific Research	Related scientific information (e.g., *predators/diseases of worms, nutritional needs of worms*) OR how to scientifically collect related data is described (e.g., *ask a biologist about the life cycle of worms, test the survival rate of worms in different temperature soils*). Stage Notes: 1. Scientific information involves relevant general scientific concepts (e.g., *predators, diseases, environmental needs of different worm species*) OR Related information gathered from appropriate sources of scientific information. (e.g., *ask a master gardener about the types of soil that support large worm populations*) 2. Scientific collecting of data involves systematically collecting pertinent data over a period of time or a number of conditions. 3. This attribute may be credited even when the information being gathered is vague to credit the "Research the Problem" attribute.	1

Scoring Rubric for: Blueberry Blues New Research & Explore (page 2 of 2)

Attributes of a Scientific Design Process

Design Process Stage	Description	Attributes
Explore Ideas	More than one idea that could solve the problem is described (e.g. *add compost, keep the soil moist, put mulch on top of the soil, bring in young worms*). Stage Notes: 1. Listing objects may not be credited. 2. Ideas may involve materials not given. 3. A sentence should be read as one idea (e.g., *Use a container with soil and gravel* is one idea, not two or three). Run-on sentences may be read as more than one idea. Sentences containing the term "or" may be read as more than one idea (e.g., *Use a metal, plastic, or glass container* are three ideas).	1
Explore Scientific Ideas	An idea includes scientific concept(s) for considering the idea (e.g., *add dark mulch on top of the soil to increase the temperature and hold in moisture*). Stage Note: This attribute may be credited even when only one idea is given.	1
	Total Possible Attributes	**4**

General Notes:

1. **Copying the Scenario:** Responses that copy the whole scenario cannot be credited for any attributes. However, responses that appropriately copy a stage from the scenario may be credited.