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| **Lesson Title :**  **Lesson 1 – Fitness and Adaptations** | **Unit #:**  **1** | **Lesson #:**  **1** | **Activity #:**  **1** |
| **Activity Title:**  **Activity 1 – The Caveman Games** |

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| **Estimated Lesson Duration:** | **Approximately 3 days** |
| **Estimated Activity Duration:** | **Approximately 1.5 days** |

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| **Setting:** | **Standard Classroom, Ryle High School**  **Weather/Conditions Depending, this activity can serve as a nice chance to take a class outside or to the gym.** |

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| **Activity Objectives:** |

Students will be able to:

* Identify adaptations and their effects on fitness.
* Explain what goes into making an organism have a high fitness level.

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| **Activity Guiding Questions:** |

How are fitness and adaptations related?

How is fitness measured?

What is fitness a measure of?

How are fitness and adaptations related to natural selection?

| **Next Generation Science Standards (NGSS)** | |
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| **Science and Engineering Practices (Check all that apply)** | **Crosscutting Concepts (Check all that apply)** |
| ☒ Asking questions (for science) and defining problems (for engineering) | ☐ Patterns |
| ☐ Developing and using models | ☒ Cause and effect |
| ☐ Planning and carrying out investigations | ☐ Scale, proportion, and quantity |
| ☐ Analyzing and interpreting data | ☐ Systems and system models |
| ☐ Using mathematics and computational thinking | ☐ Energy and matter: Flows, cycles, and conservation |
| ☒ Constructing explanations (for science) and designing solutions (for engineering) | ☐ Structure and function. |
| ☐ Engaging in argument from evidence | ☒ Stability and change. |
| ☒ Obtaining, evaluating, and communicating information |  |

| **Ohio’s Learning Standards for Science (OLS)** |
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| **Expectations for Learning - Cognitive Demands (Check all that apply)** |
| ☐ Designing Technological/Engineering Solutions Using Science concepts **(T)** |
| ☒ Demonstrating Science Knowledge **(D)** |
| ☒ Interpreting and Communicating Science Concepts **(C)** |
| ☒ Recalling Accurate Science **(R)** |

| **Ohio’s Learning Standards for Math (OLS) and/or**  **Common Core State Standards -- Mathematics (CCSS)** | |
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| **Standards for Mathematical Practice (Check all that apply)** | |
| ☐ Make sense of problems and persevere in solving them | ☐ Useappropriate tools strategically |
| ☐ Reason abstractly and quantitatively | ☐ Attendto precision |
| ☐ Construct viable arguments and critique the reasoning of others | ☐ Look for and make use of structure |
| ☐ Model with mathematics | ☐ Look for and express regularity in repeated reasoning |

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| **Unit Academic Standards (NGSS, OLS and/or CCSS):** |

**NGSS HS-LS4-2, HS-LS4-3, HS-LS4-4, HS-LS4-5**

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| **Materials**: (Link Handouts, Power Points, Resources, Websites, Supplies) |

Caveman Games PowerPoint: [Caveman Games!!!.pptx](file:///C:\Users\debbie\Downloads\Caveman%20Games!!!.pptx)

Caveman Games Grid: [Caveman Game Grid.docx](file:///C:\Users\debbie\Downloads\Caveman%20Game%20Grid.docx)

“From the Big Idea to Essential Questions WS”: [From the Big Idea to Essential Question.docx](file:///C:\Users\debbie\Downloads\From%20the%20Big%20Idea%20to%20Essential%20Question.docx)

Nerf Ball

Projector

Small objects that can be carried/passed around (ping pong balls are good, paper wads work, etc)

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| **Teacher Advance Preparation:** |

Not required, though it can be fun to “get into character” for the Caveman Games by dressing up and acting the part. You may want to practice going through the PowerPoint before “performing” in front of the class.

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| **Activity Procedures:** |

Part 1, Caveman Games:

Use the attached PowerPoint to take the class through “The Caveman Games”, a series of mini-activities centered around the theme of “survival of the fittest”. Each activity has a pass/fail scenario, and students will either “survive” the event or “die”. As they go, students will fill in the “Caveman Games Grid” worksheet, which will ask them to reflect on traits they may or may not have that would give advantages in the event. Use these as discussion points throughout the game – where do you think these “adaptations” come from, what would you expect to see in the future, what do you think happens to those who don’t have them, etc. Students will gain an understanding that adaptations improve fitness and that these are controlled by the process of natural selection.

Part 2, From the Big Idea to the Essential Questions:

Now that students are engaged and have an idea what the Big Idea will be for the next few weeks, pass out the “Big Idea to Essential Questions” WS and have them complete it. This is pretty self-explanatory and involves individual, small group, and large group parts. Collect these for review/assessment afterwards.

At this point the teacher should take some time to look through all of the essential questions that the students came up with. Obviously in this unit a challenge has already been provided, but you do want it to be connected to what the students come up with. Look through their essential questions and see if the challenge and questions are connected; if not the teacher may need to modify the challenge to better fit the questions that students have. Alternatively, if the questions aren’t quite where the teacher would like them to be the teacher could modify the unit to include something to help get students to that point – ie if students aren’t quite getting to the point of “How does nature optimize life through natural selection?”, the teacher could show different real world examples of natural selection and lead a class discussion focused on getting them to asking “Why/How does this happen?”

Once the challenge has been connected to the challenge, the teacher has a few options as to when they present the challenge to the class. You could share the challenge with the students the very next day (this gives students more time to think about it), however this unit recommends introducing the challenge right at the start of Activity 3. This puts the challenge right at the start of where the unit begins to discuss computational thinking, which makes it easier for students to make the connection between the two.

**Formative Assessments:** Link the items in the Activities that will be used as formative assessments.

-Informal class discussions during the “games”.

-Grid WS

-“Big Idea to Essential Questions” WS

**Summative Assessments:** These are optional; there may be summative assessments at the end of a set of Activities or only at the end of the entire Unit.

N/A for this particular activity.

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| **Differentiation:** Describe how you modified parts of the Lesson to support the needs of different learners.  Refer to Activity Template for details. |

Generally this activity does not need a ton of differentiation. Students will physical disabilities may have trouble doing a couple of the “events”, but you can let them sit out or modify the activity to fit their needs. You can also use this as a teachable moment if it’s something that you feel like the student would be comfortable with discussing (for example, “Joe broke his leg and is on crutches, how do you think he is going to be affect by natural selection”). This would have to be judged on a case-by-case basis.

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| **Reflection:** Reflect upon the successes and shortcomings of the lesson. |

As a “hook” for this unit, I believe this lesson was very effective. I have actually done this before in the past so I knew that this was always something students enjoyed, which is exactly what you want at the start of a unit because it grabs their attention immediately. The result of the game is exactly what you want to see as well – students start thinking about adaptations and how they impact an organism’s survival. It also confronts a major misconception students tend to have about fitness – that it’s all about physical fitness – by showing students how things like problem solving, tool using, eyesight, etc. also effect an organism’s fitness. I’ve used this for years and have always been happy with it.