**Unit Essential Question:** *How have natural processes and human activities created the ecosystems we see today?*

You will be creating an arena that mimics an environment you may see on Earth. After each task, you will return to the table below to organize what you learn as you go through the unit. By the end of the five tasks, you will have all this information to use for your culminating project. For each activity, be sure to include answers to **ALL** the questions provided.

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| Lift-Off Task: A Well-Functioning Biosphere | Your arena will be very similar to a biosphere in that you are designing your own ecosystem. Using your prior knowledge of ecosystems,   * What parts of an ecosystem should you be thinking about including in your arena? Make a list or draw a diagram of an ecosystem with parts labeled. |
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| Task 1:  Pangaea Puzzle | Over the course of this task, you gathered evidence of how past plate motions have led to some geologic features you see on Earth. As a group, decide on a location for your arena that would have the geologic features you want. Then individually,   * Draw a map showing your arena location on Earth as well as any relevant surrounding continents, making captions that answer the questions below:   + On what continent would your arena be located? Why are you locating it there?   + What features would you find (mountain ranges, types of rock, glaciers, etc)?   + How can you use plate motions to explain these features? |
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| Task 2:  Using Available Resources | Every arena needs certain resources to function. Now that you have discovered how resources have been distributed on our own Earth, decide which resources your arena will have.   * What natural resources will your arena have the most and least of? * What geoscience processes will have caused these resources to be available in your arena? * What evidence is there for why these resources are unevenly distributed? |
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| Task 3:  Produce, Reuse, Recycle | Your arena already has its main geological features, but as we learned today, there are also other non-living factors and living factors that make up an environment. Design the landscape of your arena, focusing on the non-living things that will be needed to support life.   * Draw a visual diagram showing how this non-living matter will cycle through your environment (You do not need to pick specific plants and animals for your arena yet; you can just draw example plants and animals for this diagram).   + Be sure to label the examples of living and non-living matter and use arrows to show where they go. |
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| Task 4: Interactions Between Organisms | In your arena, you will be creating a challenge for your contestants, so the winner may win additional supplies. The challenge will be to locate a specific plant/animal by using information about another plant/animal. The contestants will use their knowledge of ecosystem interactions to connect the known plant/animal to the unknown plant/animal.   * Identify what plants and animals you will include in your arena. * Design this challenge by making a flowchart tracing one organism to another using at least two different organism interactions we have studied. * Explain how each plant/animal leads the contestant to the next plant/animal by describing the organism interactions. |
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| Task 5:  A Chain of Resources | Reflect back on the last two responses in your Project Organizer. Think about what key resources are needed in order to accommodate the organisms you have chosen. Based on these key resources, prepare for the worst:   * If budget constraints resulted in removal of one main resource, predict what will happen to the populations of different organisms in your arena. * Figure out as many effects as you can and explain them in a flowchart or paragraph format. Use data from the task to justify your predictions. |
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