

Name: \_\_\_\_\_

## Adapt a Plant

Think about the most important characteristics of the biomes you explored at Matthaei. Imagine a plant that would survive well in each one. What adaptations would it need? For each biome listed below, draw your plant in the box, and label its adaptations. On the lines, explain how those traits help the plant meet its needs in its environment.

### Desert (Arid)



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### Tropical Rainforest



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## Warm Temperate

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## Temperate (Michigan)

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### Desert (Arid)



#### Desert Adaptations

- Stems and leaves that store water: allows the plant to use stored water during dry times
- Pleated stems: enables the stem to expand as it takes in water and contract as the water is used during times of drought
- White hairs: reflect light and prevent bleaching of the stem from overexposure to light
- Spines: modified leaves that deter animals from eating leaves and stems for water
- Photosynthesizing stems: perform photosynthesis because spines are modified leaves that do not photosynthesize

### Tropical Rainforest



#### Tropical Rainforest Adaptations

- Smooth bark: makes it more difficult for vines and other plants to grow on the surface of trees, reducing competition for light
- Epiphytes (including bromeliads): grow on the trunks and branches of other trees in order to access sunlight, which is scarce in the understory
- Vining: allows plants to have their roots in the ground and still access sunlight in the canopy
- Drip tips and smooth leaves: enable rain to quickly run off leaves, preventing growth of molds
- Large leaves: often found in the understory, capture a lot of sunlight for use in photosynthesis (growth)

## Warm Temperate



### Warm Temperate Adaptations

- Thick bark: protects the tree from fire and decreases moisture loss during the dry season
- Small leaves: decrease the amount of moisture lost to evaporation during photosynthesis
- Light colored leaves: reflect more sunlight than dark colors, decreasing loss of water during dry times with high levels of sunlight
- Rough leaf surfaces: trap droplets of water on the leaves, preventing overheating
- Insectivorous plants: trap and digest insects to obtain the nutrients they need in their low-nutrient habitat (bog)

## Temperate (Michigan)



### Temperate Adaptations

- Broad leaves: capture lots of sunlight during seasons in which sunlight is plentiful
- Leaf senescence: deciduous trees drop leaves in the fall, avoiding the damage freezing would cause
- Dormancy: resting period in which plants reduce respiration and transpiration in order to withstand freezing
- Needle-like leaves: can survive in colder weather, allowing conifer trees to keep their leaves all year rather than dropping them in the fall
- Thick bark: helps retain moisture by limiting the evaporation of water

\*Students may wonder about the difference between the Warm Temperate and Temperate (Michigan) biomes. A distinction is made here because the plants in the temperate house conservatory are from the Mediterranean or similar climates--parts of the world that do not freeze. Thus, plants in this biome have some different adaptations than plants in our region.