

A graphic for AP Biology FRQ Fridays. The background is a light green grid. A large, light green, rounded rectangular shape is in the center. Inside this shape, the text 'AP Bio' is written in a large, dark green, rounded font with a pink shadow. Below it, 'FRQ Fridays' is written in a large, purple, rounded font with a pink shadow. Underneath that, '2018 #3' is written in a smaller, black, sans-serif font, followed by 'Experimental Design' in a larger, black, sans-serif font. To the right of the text is a small, cute penguin character with a black body, white belly, and a small black hat. The penguin has a small 'Hi!' above its head. The entire graphic is surrounded by various colorful illustrations: a DNA double helix in red and blue, a yellow pencil with a pink eraser, a purple spiral notebook with 'NOTES' written on it, yellow paper clips, and teal exclamation marks. There are also some teal cloud-like shapes and orange and green squiggly lines.

2018 #3
Experimental Design






FRQ Friday #27

2018 #3




Seagrasses are aquatic plants that reproduce sexually. Male seagrass flowers produce sticky pollen that is carried by circulating water to female flowers, resulting in fertilization. A researcher claims that mobile aquatic invertebrates can also transfer pollen from male to female flowers in the absence of circulating water. To investigate this claim, the researcher set up aquariums to model the possible interactions between the invertebrates and seagrasses.

- (a) Use the symbols below and the template aquariums to demonstrate the experimental design for testing the researcher's claim that mobile aquatic invertebrates can pollinate seagrass in the absence of circulating water. **Draw** the appropriate symbols in the negative control aquarium AND the experimental aquarium. Do not use any symbol more than once in the same aquarium.

Male Flower	Female Flower	Invertebrates
		



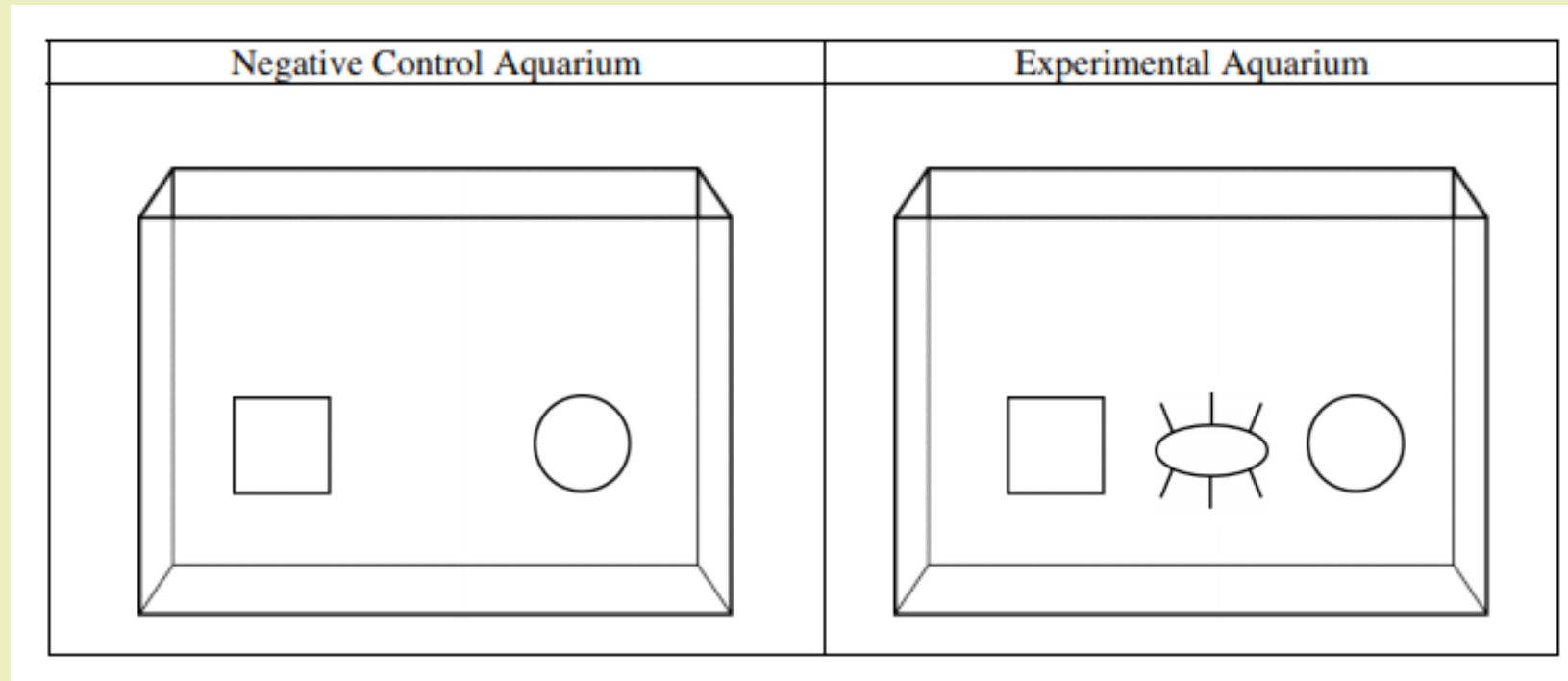
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2018 #3

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Claim: mobile aquatic invertebrates can also transfer pollen from male to female flowers in the absence of circulating water.



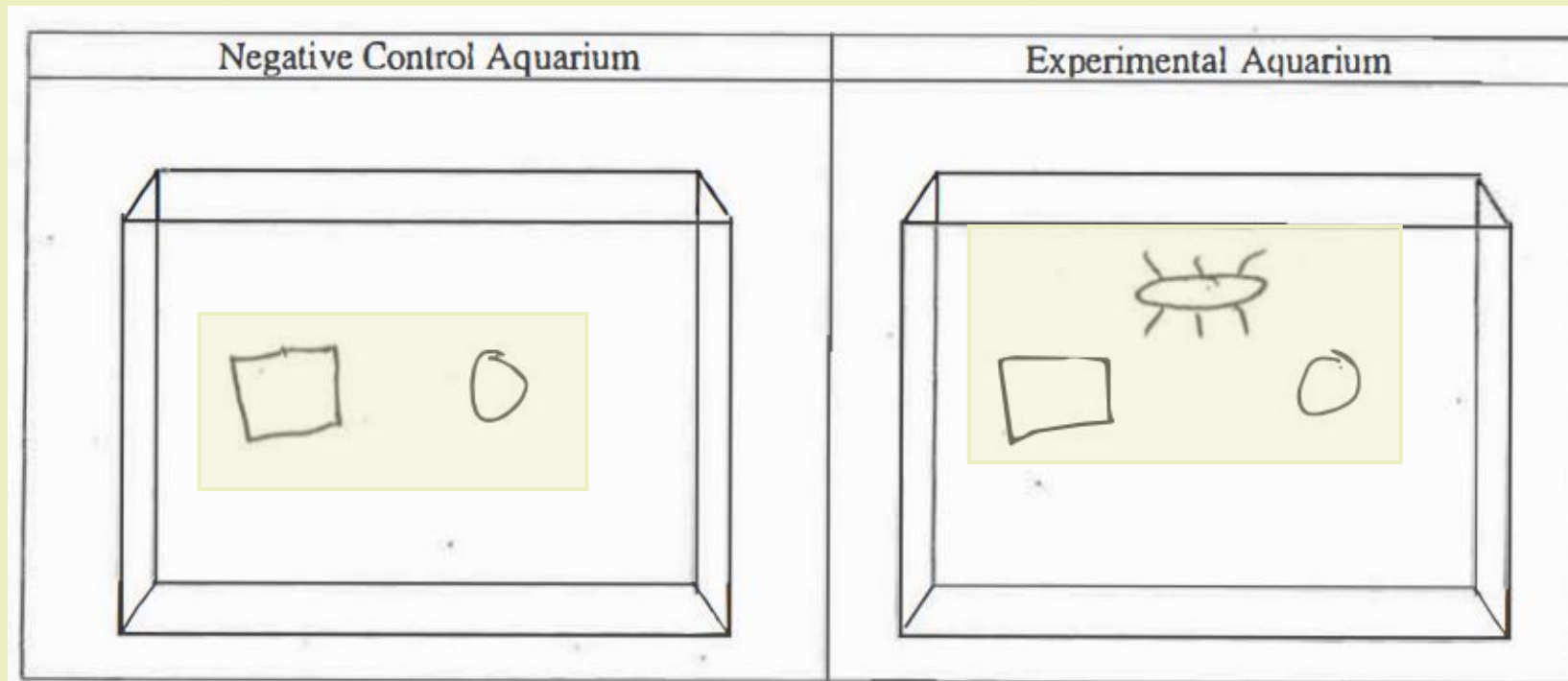
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(b) **Identify** the dependent variable in the experiment. **Predict** the experimental results that would support the researcher's claim that mobile aquatic invertebrates can also transfer pollen from male to female flowers in the absence of circulating water.

Identification (1 point maximum)	Prediction (1 point maximum)
Number/presence of pollen grains on female flowers OR pollination	More pollen grains transferred/pollination seen in experimental aquarium
Number/presence of fertilized plants/flowers OR fertilization	More fertilized plants/flowers/fertilization seen in experimental aquarium
Number/presence of seed/fruit/offspring produced OR reproduction	More seeds/fruits/offspring produced/reproduction in experimental aquarium



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B) The dependent variable would be amount of fertilization that occurs between the male and female seagrass. I predict that more fertilization will occur in the experimental aquarium because the invertebrates will transfer pollen from the males to females.

