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Introduction of The Experiment.

Gold Fish is one of popular fish in Indonesia. It is a favorite fish for ornamental fish tank. Scientist identified that the reproduction of gold fish is influenced by photoperiodic or water aeration. However the effect of both factor is not know yet. You are asked to design an experiment about the effect of photoperiodic, water aeration or both of them.
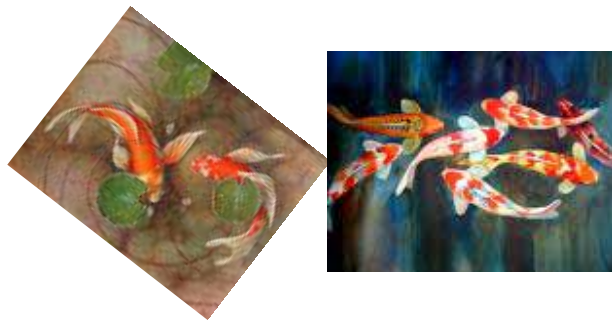
A. THESE ARE SOME MATERIALS YOU MAY NEED TO SIMULATE THE EXPERIMENT :

1. Blue paper   1
2. Green paper   1
3. Yellow paper   1
4. Coin   2
5. Goldfish card   100

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B. TASK

1. Design an experiment to show relationship between both environment factors.

   - You can use blue paper for pond with aeration system, green paper for pond with photoperiodic system and yellow paper for pond having both systems

   - You can use two coins to simulate the increasing number of individual fish on the paper. If you toss the two coins together, they will appear in three different combinations :

     a. **Picture - number** will represent additional of two fishes on the **blue** paper

     b. **Number – number** will represent additional of two fishes on the **green** paper

     c. **Picture- picture** will represent additional two of fishes on the **yellow** paper

   - **Write the number of fishes you use for each paper at the beginning of the experiment:**

     a. Blue paper   : ……………………

     b. Green paper   : ……………………

     c. Yellow paper   :……………………

        (Number of fishes at the beginning should be same for each paper) (score 3)

        Note:

        Small difference (max 5) => 2

        All zero or 1 score 0

   - You should toss the coins together for 30 times.

   - You may put the goldfish-card on corresponding paper based on the result of tossing and record your result on the table at the answer sheet. (score 6)
     Note :
     Full table   : 6
     Each color   : 2
     Blank table   : 0   Only half table : ½ full mark

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Example : number of fish at beginning 2

	Blue paper		Green paper		Yellow paper	
	Number of individual	**Total number of fish in the population**	**Number of individual**	**Total number of fish in the population**	**Number of individual**	**Total number of fish in the population**
Number of fish at the beginning	2	2	2	2	2	2
Toss 1	0	2	2	4	0	2
Toss 2	2	4	0	4	0	2
Toss 3						
Toss 4						
Toss 5						
Toss 6						

- **After you finish with the experiment save the goldfish card from each paper into different bag and labeled (score 2)**

- Make a graph based on the table of your result. Total number of gold fish in the population should be written on the Y-axis and the toss result should be written on the X-axis (*indicate/label the line you use*) (score 6)

  Each correct graph : 2

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Based on your experiment, answer the following question :

1. Which pond has the highest number population after 30 tosses? (**score 2**)

    Blue paper or pond with aeration system or blue

    ……

2. What factor is responsible for promoting the reproduction of gold fish? (**score 2**)

    Aeration ……

    ……………

3. What factor is **not** repress the reproduction of the population of gold fish? Explain. (**score 2**)

     2 for all (photoperiodic or aeration, both of them etc)

     0 for nothing

    ……

4. The weakness of this experiment is ……**.** Explain your answer (**score 2**)

     Open anwers example in this experiment there's no control, offspring always 2

    ……

    ……