

The clock reaction



Student worksheet

Engage - What's interesting?

Task



Watch the following silent movie video - <http://goo.gl/9G7fDz>

Can you describe what happens in the video? Why do you think it happens?

While watching write what you see and questions that relate to what is happening. You may watch the video more than once.

Explore - What's happening?

Materials

You will get three solutions:

Solution A – Potassium iodide, KI 0.1M

Solution B – Hydrogen peroxide, 3% $\text{H}_2\text{O}_2(\text{aq})$ in an acidic environment + starch

Solution C – Sodium thiosulphate, $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O} \sim 0.05\text{M}$

Goggles and gloves must be worn at all times

Instructions

Three stoppered plastic test tubes with the solutions A1, B1, C1 are given.

Task 1

Pour 2 ml of solution A1 into the test tube marked "B1" (containing 4 ml of solution B).

Close the test tube, mix lightly and write your observations.

Gradually add 6 ml of solution C1 to the "A1+B1" solution you prepared above.

Close the test tube, mix lightly and write your observations.

Task 2

Three stoppered plastic test tubes with the solutions A2, B2, C2 are given.

Prepare the stopwatch in your smartphone to take times.

Pour 2.5 ml of solution A2 into the test tube marked "C2" (containing _ ml of solution C).

Add 5 ml of solution B2 to the "A2+C2" solution.

Immediately start the stopwatch (one person should mix and another should start the clock).

Close the test tube, mix lightly and write your observations.

Task 3**Class presentation**

This time, you will perform your experiment in front of the class

Three stoppered plastic test tubes with the solutions A3, B3, C3 are given.

Pour 5 ml of solution A3 into the test tube marked "C3" (containing _ ml C).

Pour solution "A3+C3" into a cup.

Prepare one smartphone on stopwatch mode and another smartphone to film a video!

All group representatives will at the same time add 10 ml of solution B3 to their "A3+C3" solution.

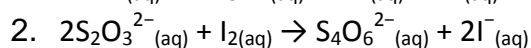
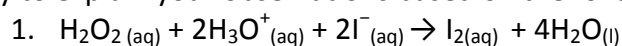
Have someone start the stopwatch and record the times a change occurs.

Have someone else film the experiment.

Explain What's causing it?

Task 1

Try to explain your observations based on the following reactions:

**Task 2**

The teacher will gather the findings of all groups in class. How do you suggest we present the data collected?

Extend What's similar?

Task 1:

In your groups – plan a creative activity that is based and incorporates the colour change. For example the solution turns colour at a highlight in a song that is played.

Plan an experiment that you will incorporate.

- Detail of all the steps of the experiment.
- List the equipment and materials needed on the equipment request form.
- Consult with the teacher and make changes if necessary.
- Submit the list of equipment and materials to the laboratory technician.

Evaluate What's my understanding?

Task 1:

Present to the class the creative activity that incorporates the colour change.

Task 2:

Prepare a formal lab report that includes an explanation of the phenomenon, and details of your methods and procedures.

We hope you enjoyed the activity!

The volume of C will be determined after preparation of solutions for activity

Solution	Volume (ml)	Number of test tubes
A1	2	6
B1	4	6
C1	8	6
		18

Solution	Volume (ml)	Number of test tubes
A2	2.5	6
B2	5	6
C2	1	1
C2	1.25	1
C2	1.5	1
C2	1.75	1
C2	2	1
		17

Solution	Volume (ml)	Number of test tubes
A3	5	6
B3	10	6
C3	2	1
C3	2.5	1
C3	3	1
C3	3.5	1
C3	4	1
		17

10 ml thiosulfate should be given