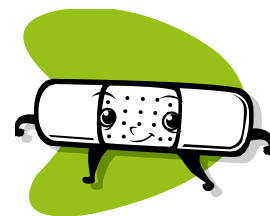


Hydrate Me!



Introduction: In research today, scientists are working with hydrogels for wound healing. These hydrogels are being studied using various types of wounds from burns to severed nerves.

Hydrogels are polymers that are made of mostly water. This property alone makes them a good candidate for wound healing because the wound needs to be kept moist in order to heal properly. Another reason why moisture is important is that it allows oxygen flow to the wound. Hydrogels have also been found to help the body remove dead tissue which also aids in the healing process. You will be determining how much water a hydrogel can absorb and you will compare three hydrogels to find out which one would be the best type for use in wound dressings. You will be using three hydrogels that can be found easily in everyday products. The products are Jell-O (collagen); orbeez (silica gel); and squishy baffle (sodium polyacrylate).

Materials (per group of 4):

4 plastic cups
1 10 ml graduated cylinder
1 funnel
3 filter paper
1 Digital Scale
1 Scoop/spoon
3 weigh boats
3 stir straws or glass stirring rod
Source of warm water (enough for 10 ml per group)
Masking Tape
Pen
10 Orbeez
Squishy Baffle
Jell-O

Methods:

1. Place a weigh boat on the digital scale. Zero the scale. Obtain 10 orbeez and place them in the weigh boat and write down the mass of the 10 orbeez.
2. Mass an empty plastic cup.
3. Place your orbeez into the plastic cup and label the cup with the substance and your name/date using tape.
4. Utilizing the same method as you did for the orbeez, weigh out the same mass amount in squishy baffle and Jell-O. Don't forget to mass the plastic cup as well.
5. Make sure to place the substances into a different cup and label them properly.

6. You will then add 10 ml of water to each sample. You will need warm water for the Jell-O. Obtain this from your teacher.
7. Write down any observations.
8. Stir all the substances.
9. Re-mass all the samples.
10. Set your samples aside and allow them to form/gel. Wait 24 hours.
11. Get substances and write down any observations that you have noticed making sure to use all of your qualitative observation skills.
12. Mass the cup again.
13. Take another plastic cup and place a funnel on top along with a folded filter paper (Fold filter paper in half and then half again so you end up with a cone shape to place in funnel).
14. Mass the filter paper.
15. Pour the contents of the orbeez cup into the filter/funnel, making sure not to lose any of the orbeez.
16. Subtract the mass of the orbeez from the filter paper. This is the mass of your substance with the water removed.
17. Mass the water and then put the water into a 10 ml graduated cylinder and write down the volume.
18. Calculate the difference in volume from the original volume added.

Data:

	Orbeez	Squishy Baff	Jell-O
A. Substance mass			
B. Plastic Cup mass			
C. A + B			
D. C + 10 ml Water mass			
E. Observations when added water			
F. Observations after 24 hours			
G. Mass of cup w/ substance and water after 24 hrs.			
H. Subtract D from G			
I. Mass of filter Paper			
J. Mass of substance on filter paper			
K. Subtract A from J			
L. Volume of water obtained from			

substance			
M. Difference in original volume of water			

Observations: _____

Write a lab report on this lab activity. A lab sample along with a rubric is attached. Make sure to include a copy of the data table and make sure you also include graphs of this data. Include the following questions either in your introduction of this topic or in your analysis of the data.

1. What is a hydrogel and how is it formed?
2. What research is currently being done on wound healing with hydrogels?
3. What is Squishy Baff? How does it work?
4. Which held more water, Squishy Baff, Jell-O or Orbeez?
5. Which of these substances is the best type to use based on water absorption?
6. What will be the benefit of using a bandage with a hydrogel?
7. If you could design a bandage that would help to heal wounds, what type of bandage would you use or design?
8. Did all of the water go into the substances? If not, where did the water go? What does H represent in the data table?
9. What other factors are important in studying a bandage for wound healing?
10. Do you think that the temperature might have had an effect on the substances used in this lab and what could you do to test that theory?
11. Are there any other new areas of research on wound healing other than hydrogels?