Yeast Magic

Komal Zahrah, Justyna Resztak, Russell Finley, Francesca Luca

Center for Molecular Medicine and Genetics
Wayne State University
fluca@wayne.edu

How to prepare for the experiment (for 35 children)

- Prepare Agar plates 1 week in advance (see protocol)
- Prepare a stock plate of yeast 1 week in advance

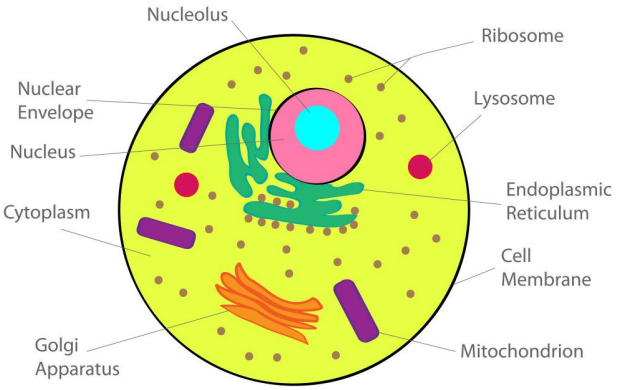
- Material to take to the school:
  - 1 plate per child + 5 extra plates
  - Sticks
  - Gloves
  - Handouts (1 per child + 5 extra)
  - 35 copies of the patterns
  - 15 tubes (500ul each) of 1:10 yeast dilution from the liquid culture
    - The liquid culture is prepared in 1 ml from colonies covering 1 cm^2
  - 50 ml falcon tubes x35
  - ~10 markers
  - Lab coats

Note: This activity can be combined with ”Slimy Cell”

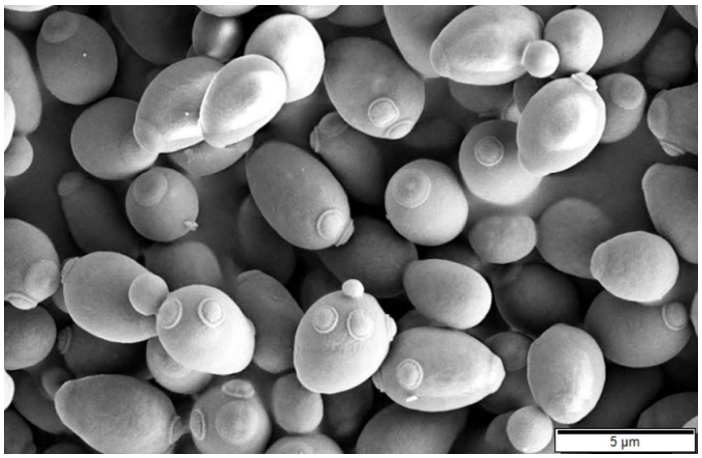
Cells and Yeast

The cell is the basic unit of life. Cells are the building blocks of our body. Plants, animals, fungi and even microbes are made up of cells. There are trillions of cells in the human body.

Inside a Cell



AmoebaMike.WordPress.com

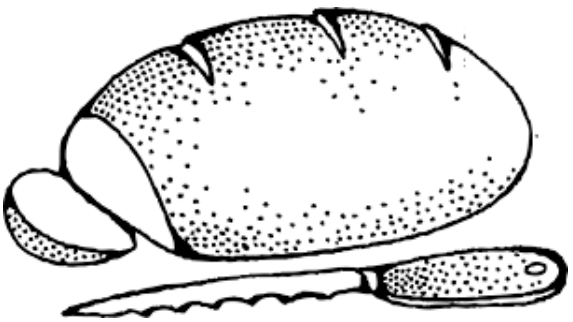


What Is Yeast?

1. Yeast is made up of a single cell.
2. It is a member of the fungi kingdom, meaning it is related to mushrooms.
3. Yeast does anaerobic respiration. All living things breathe, but yeast can do it with or without oxygen.

Yeast Fun Facts:

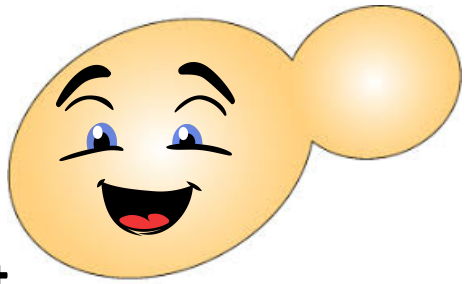
1. It is used for baking bread.
2. Yeast cells can live for a few days, they can be frozen and they will wake up when thawed.
3. Their favorite food is sugar.



"Silly Science" is organized by the Luca and Finley Labs.
www.lucalab.org

WAYNE STATE School of Medicine

CENTER FOR MOLECULAR MEDICINE AND GENETICS



Bubbling Yeast

Materials	Procedure
Falcon tube	Add 30 ml of water in the tube
½ tablespoon of sugar	Add sugar and dry
½ tablespoon of dry yeast	Mix the ingredients together with the wooden stick
30 ml of warm water	Mark the mixture level
1 wooden stick	Wait 20 minutes and observe if the mixture changes level
1 sharpie marker	

Yeast magic

Materials

- Yeast
- Agar plate
- Wooden stick
- Drawing template

Procedure

1. Label the plate with your name along the border.
2. Flip the plate and position it over your chosen drawing template with your name facing down.
3. DO NOT TOUCH the inside of the plate with your hands
4. Open the lid. **make sure lid is facing up**
5. Take a wooden stick and dip the tip of it into the tube containing yeast.
6. Start **lightly** drawing on the agar plate with the wooden stick and follow the design. Make sure not to scratch the plate.
7. Put the lid back on.
8. Flip the agar plate with the lid down to avoid condensation.
9. Come back after 1 week to check your Yeast magic and have some more Science Fun!

Note: DO NOT touch the agar in the plate with your hands!

How to Prepare Agar Plates (YPD plates)

Materials for Yeast stock:

- Lab gloves
- 1 liter bottle with cap
- 10 g of bacto yeast extract
- 20 g of bacto peptone extract
- 25 g of bacto agar
- 900 ml of Distilled water
- 2 pellets of NaOH
- 25-30 petri dishes for one L bottle
- 1 bunsen burner
- 70% ethanol
- 20% glucose sterile stock
- a tray
- Autoclave tape
- Stir rod
- a hotplate magnetic stirrer

Material for 20% Glucose stock:

- 1 liter bottle with cap
- 200 g of powdered glucose
- 1 L of distilled water
- 10 of 100 ml bottles with caps
- Autoclave tape

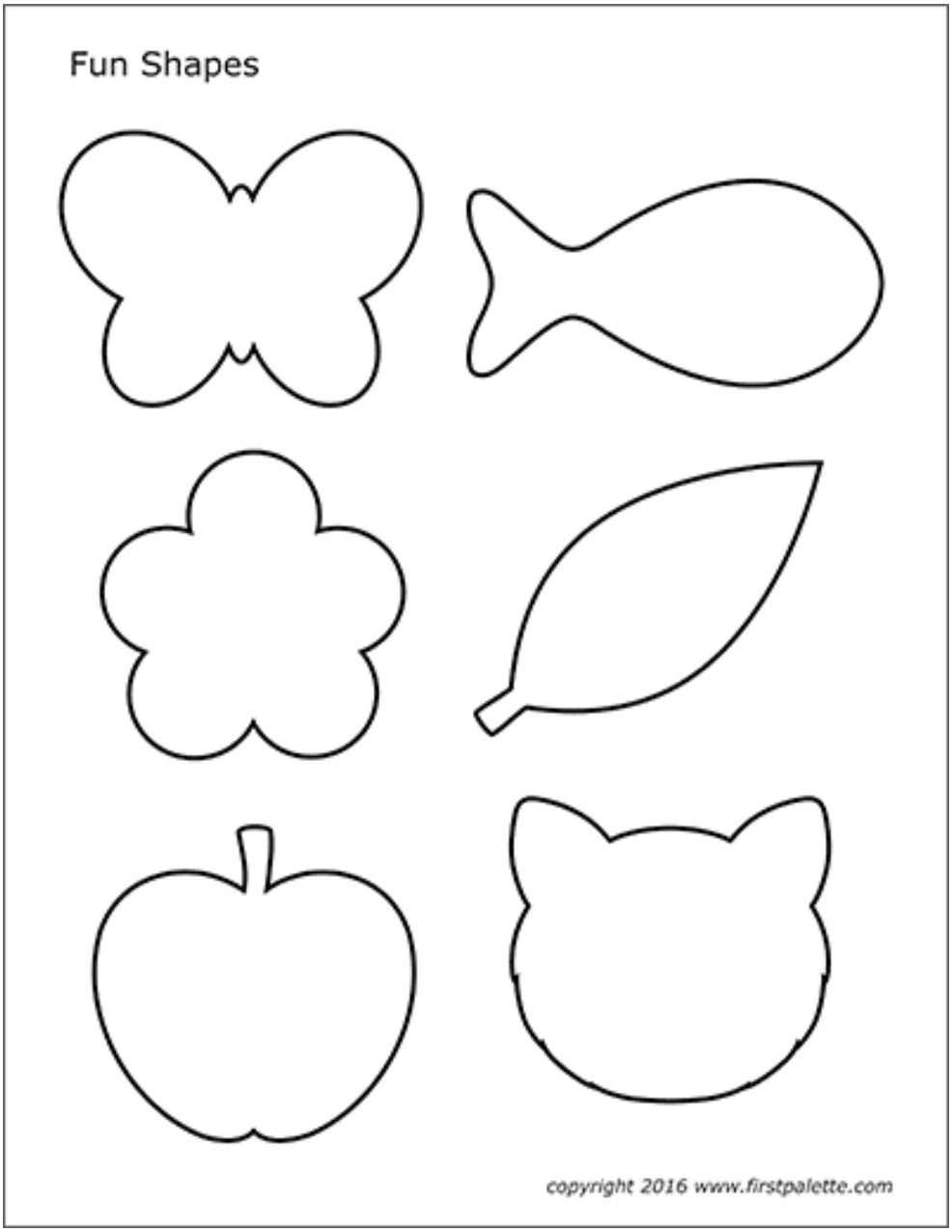
How to make 20% glucose stock:

1. Put the 1 L bottle and a clean stirring rod in the bottle and put it on a hotplate magnetic stirrer
2. Add 500 ml distilled water in a 1 L bottle and then add 200 grams of powdered glucose.
3. Add the remaining 500 ml of distilled water and the stock stirred thoroughly
4. Add the stock into 100 ml bottles and close the cap and add autoclave tape (close the cap and leave it a little loose) and autoclave it
5. Store it in room temperature

1. Wear lab gloves
2. Fill a 1 liter bottle with distilled water up to approx. 500 ml to start off
3. put a clean stirring rod in the bottle and put it on a hotplate magnetic stirrer
4. Use a weighing scale and add 10 g of bacto yeast extract onto a paper and dump in bottle, wait until completely mixed
5. Then add 20 g of bacto peptone extract onto a paper and dump in bottle, wait until completely mixed
6. Add distilled water until filled up to 900 ml
7. Add 25 g of bacto agar
7. Add 2 pellets of NaOH into the bottle
8. Stop the stirring
9. Close the cap and add a piece of autoclave tape on it (screw it on but leave It a little loose)
10. Put the bottle in a tray with water (water covering all of the bottom at least)
11. Put the media in the autoclave on liquid cycle, when the autoclave is ready, put it in and the whole cycle including exhaust should take about 90 minutes
12. After the autoclave is done, be careful of the steam coming out and wear gloves to take out the media.
13. Add 100 ml of the sterile 20% glucose into the yeast stock.
14. Put the Yeast bottle on top the the hotplate magnetic stirrer and turn it on.
15. Wait about 1.5- 2 hours, for the media to be a bit cooled down. Make sure you come back consistently between these time frames (You want the media to still be warm, should be warmer than room temperature but enough for you to touch the bottle. If if becomes to cool the agar will have chunks).
16. Clean the work area with ethanol and turn on the Bunsen burner
17. Take and bottle cap off and flame the bottle top, then pour the liquid media into the petri dish until ¾ filled and then IMMEDIATELY put the petri dish's lid back on in order to maintain sterility. (make sure lid of the petri dish is facing up)
18. Keep on repeating step 15 until all petri dishes are filled
19. Pour the stir rods in a separate dish
20. Now wait for the the agar to cool. It will take about days to cool down. Make sure you leave it out in room temperature in a sterile environment.
21. One bottle makes about 25 plates

note: keep the cap on top of the bottle at all time unless adding materials in it. Also if you put cap on table make sure lid is facing up

Shape Template



Credits

- Yeast facts: http://www.softschools.com/facts/organisms/yeast_facts/2897/
- More yeast facts: http://sciencewithme.com/what-is-yeast/
- Yeast pic: on yeast magic : https://upload.wikimedia.org/wikipedia/commons/1/14/201108_budding_yeast.png
- Smiling face; https://www.goodfreephotos.com/albums/vector-images/large-happy-face-vector-clipart.png
- Yeast micro level pic: https://www.bing.com/images/search?view=detailV2&id=43B8A92F7B9B3AFC984ECFEC10D32D59473581C6&thid=OIP.x-4Y21-icuhPxrBDk8GawQHaEy&exph=775&expw=1200&q=saccharomyces+cells+cultures&selectedindex=10&ajaxhist=0&vt=0&eim=0,1,2,6
- "Inside a cell": https://encrypted-tbn0.gstatic.com/images?q=tbn%3AANd9GcQ29PjSaiA-da5bgeAjdZugAfWpeJ-amWwTMKYmGnXGwhOKRoQO
- Bread: http://www.publicdomainfiles.com/show_file.php?id=13546101611265