

***Lesson Title: Basic needs for the sustainability of human life and that of other organisms***

***Curriculum area: Science: Diversity of Life/ Microorganisms***

***Unit Plan:*** Grade 6 Science – Unit 1: Life Science

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***Grade Level: 6***

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***Time Required: 60 minutes***

***Instructional Groupings: Individual, whole-class, small groups, flexible groupings.***

***Curriculum outcomes:***

1. Identify different ways to classify living things in their local habitat, and select one
2. Describe how microorganisms meet their basic needs, including obtaining food, water, and air, and moving around.
3. Propose questions to investigate and practical problems to solve.
4. Record observations using a single work, notes in point form, sentences and simple diagrams and charts.

***Materials:***

- Smart Board/White Board
- 2 containers of (bakers) yeast
- 5-7 Water bottles/Plastic Baggies
- Bag of sugar
- Lab materials (measurement tools, paper towel, etc.)
- Observation sheets for each group
- Choice Assessment/Project Sheet

***Overview:*** To build on students prior knowledge of living things and microorganisms by brainstorming. This lesson will be extended so that students will be able to engage in an experimental activity. They will be able to understand first hand what a microorganism (yeast) needs to live and how it best thrives. Students will also learn the first steps of the scientific and experimental method.

***What will I differentiate?***

- The method of completing the experiment (physically in the lab, or virtually).
- Student grouping
- The post-assessment assignment.
- An extra (more complex) task for students to complete if they want a challenge or are finished early.
- Methods of contributing to the class brainstorming activity.

***How will I differentiate?***

- Students have the option to write or draw their ideas for the brainstorming activity.
- If students are not able to physically complete the experiment, they can view the virtual field trip online and write observations based on the video:

<http://www.youtube.com/watch?v=Ckesvr-51i0>

- Students who many need to be challenged can use this website, <http://mosimbio.upc.edu/research-topics/food-technology/yeasts>, to further their knowledge on microorganisms. (See extension activity below as well)
- There will be choice homework based on interest (ex: Multiple Intelligences and Bloom's Taxonomy).
- Grouping students by ability

**As a result of this lesson, students will...**

*Understand:* The basic necessities of life for all living organisms and how to develop an experiment.

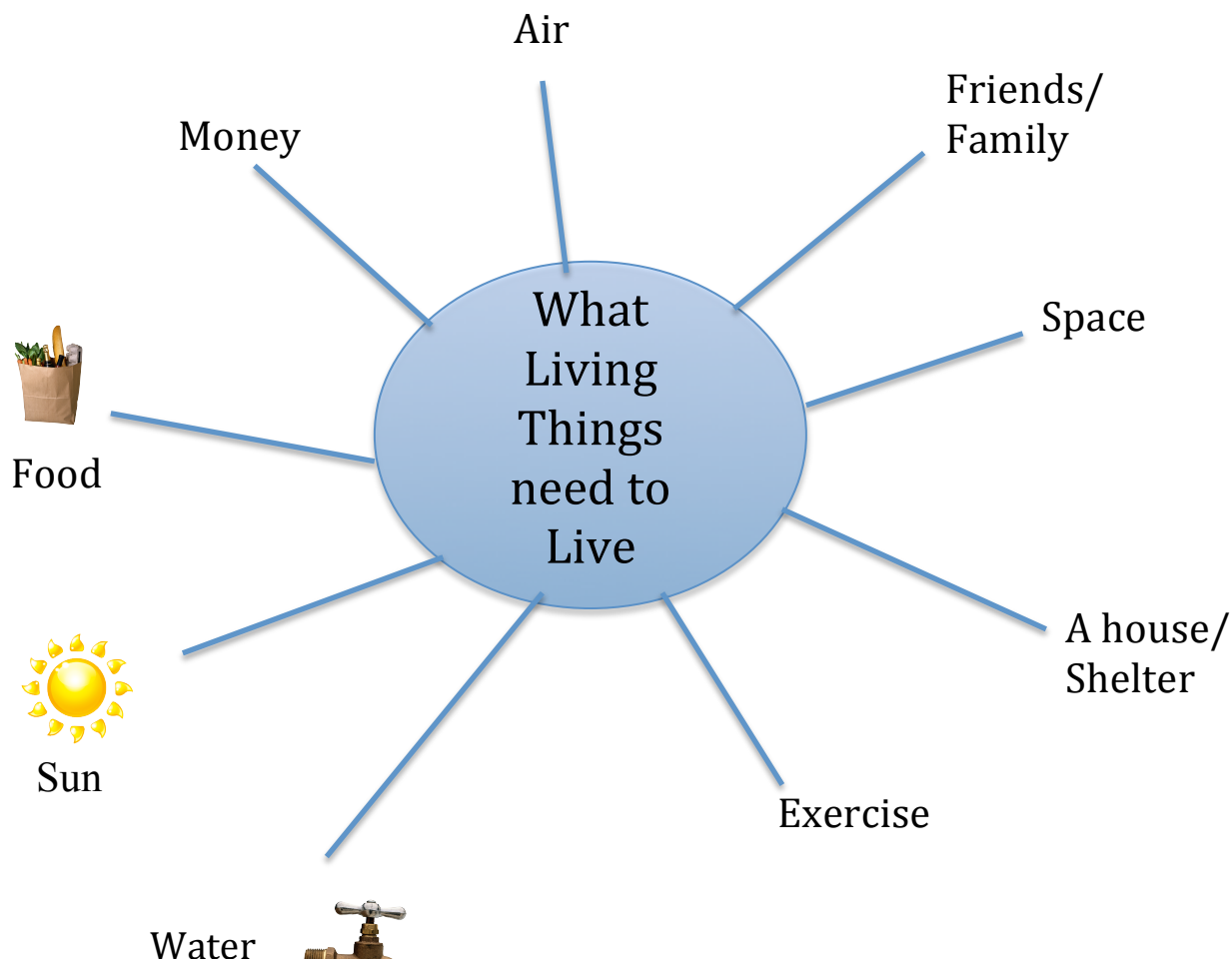
*Know:* How to sustain life for humans and other organisms.

*Do (skills):* Simple recording and manipulating of scientific method.

**Pre-assessment [10-15 minutes]**

1. Talk about the observations that students made from last day (last science class the students went on a field trip to a marshland [Duck's Unlimited] in St. George, NB). Where they were asked to note and record one individual organism and the environment in which they lived and the factors that contribute to their life.
2. Students are asked record a Brainstorming Web on the Smart Board or white board facilitated by a discussion with students as a whole class.
3. All students will be able to contribute something to this, if students don't feel comfortable commenting out loud have them come up and write on the board. Students are invited to write or draw their answers.

*\*Example Below*



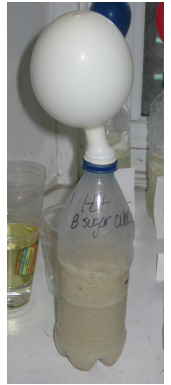
**Steps in the Lesson:** (35-40 minutes)Microorganisms' Basic Life Necessities Activity

- Next we will be conducting an explorative experiment where students will have a chance to see and experience what an organism or creature needs to live. Remind students of our discussion of what a microorganism is: (extremely tiny organisms that can only be seen under a microscope. Microorganisms are one of the most diverse organisms and they include bacteria, fungi, archaea, protists, green algae, plankton and amoeba.) Explain that today we will be working with a very practical and small everyday organism called yeast. Ask students what they know about yeast. Clarify that yeast is a living thing and that they are apparently 'inactive' until motivated. Tell students that we will be doing an examination to find out what yeast need to live and under what conditions they best thrive.
- Make students aware of the rubric that will be used to assess their learning:

Got it	Nearly there	Not yet
Question is <b>stated clearly</b> and in a <b>testable</b> form	Question is <b>clear</b> but not in a testable form.	Question is <b>unclear</b> .
Materials list includes <b>all necessary</b> and <b>appropriate</b> items.	Materials list <b>incomplete</b> .	Materials list <b>incomplete</b> and contains <b>unnecessary</b> items.
Written steps <b>are detailed</b> and in <b>sequential order</b> . Steps are detailed enough that <b>variables are controlled</b> . Procedure <b>could be replicated</b> .	Some steps <b>are unclear or missing</b> and/or steps are <b>out of order</b> . <b>Missing</b> some <b>details</b> that would <b>control one or more variables</b> during the replication.	Steps are <b>not accurate</b> or there is <b>not enough detail</b> to replicate procedure.
Spelling and grammar <b>errors are absent or rare</b> .	<b>Some</b> spelling and grammar <b>errors</b> .	Spelling and grammar <b>errors common</b> .

- For this lesson students will be grouped into predetermined groups of three where there is one expert or mastery level student, one student of average knowledge/understanding, and one student who is struggling, behind, or on the lower level of comprehension. (The stronger students would aid and provide supports for the learners who require support. A team leader is responsible for all group members to ensure that they all contribute and understand the task or learning objective at hand.)
- Explain to students that this is a collaborative activity and that you will be frequently walking around to ensure that students are participating, effectively working in a group, and staying on task.
- Remember that type of activity has only been modeled twice by the teacher therefore this information should be considered when assessing and marking.
- Have students form into their groups as directed by the teacher.
- Ask students if food, water, and air are needed by yeast.
- Have students ask (and record) a testable question with respect to the needs of yeast. Remind them that the only materials available are water, sugar, yeast, balloons, empty bottles, and zip-lock baggies. (Some appropriate questions might be: "Does yeast seem more active with warmer water or colder water?", "Does the amount of water/air/yeast/sugar make a difference?" "What happens to yeast when mixed with water/sugar?")
- Have the groups complete their experiment. Ensure students understand that the experiment needs to be fair, with variables controlled. This is a good opportunity for E.A's to help students with writing, recording, and reading.

8. Walk around during this time. Ask questions and help students where they might have issues or may be struggling. Ensure that all group members are actively participating and that things are being recorded, as they are being completed and observed.
9. Remind students that they should be ensuring that their notes are clear and reproducible, (so that other scientists may follow them and get similar results) and that they are recording everything they are doing.
10. Students who choose to do the experiment with the balloon (*which coincides with the more mastery level student*) rather than the plastic zip-lock baggie, will have results similar to that shown in the photo to the right.
11. Once every group has had a chance to observe their experiment multiple times over the half hour period, ask students to clean up their areas, put all materials away, and finish up their report.
12. After the areas have been cleared and things are neat and tidy, have students go back to their seats individually.



**Possible extension:**

Along with the extra website to further one's understanding of yeast, an extension or more complex level of inquiry could be carried out; different student groups try depriving yeast of different things. Do students realize the value of having a control? This could also be the second part of the experiment if time allows or if students are interested (however you should ensure that students have a very solid or mastery understanding of the concepts before moving forward with this extension). Having students who complete the experiment early test out this idea, will also allow for more time for the students who may be struggling to catch up and free up the teacher to help.

**Closure Activity/Wrap up [5-10 minutes]**

Students will have time to complete their observation sheet from the experiment in their groups. They will hand in their sheets for the teacher to evaluate. Present the sheet of choices for the assignment to be worked on next day.

**Post-Assessment [30 minutes]**

*\*This activity will take place at the beginning of the next class, however it is discussed here because students will be presented with their choices at the end of the current lesson.*

Students will have choice projects to be started in class the following day. Students have the choice of completing this assignment in pairs or individually. During the next class students will be asked to work on the assignment. If they do not finish they are able to work on it at home and hand it in next day.

**Additional Resources:**

- GNB: Science Resource Package – Grade 6: Diversity of Life

Topic/Concept: Diversity of Life: Basic Needs for Organisms

Name(s): \_\_\_\_\_

Activity/Project Choice: \_\_\_\_\_

Plan for approach and research: \_\_\_\_\_

**Please choose the option that best suits your learning style(s) and interests**

<p><b>A.</b> Create a PhotoJournal to complete the sentence/paragraph: <i>On my field trip to...</i></p> <ul style="list-style-type: none"> <li>- Focus on one aspect of the trip.</li> <li>- Include descriptions of observations and what you learned.</li> <li>- In this PhotoJournal you may use Internet or personal photos.</li> <li>- Discuss what a certain organism needs to live and how it meets these needs.</li> </ul>	<p><b>B.</b> Illustrate a poster (or use internet software like <i>Prezzi</i>): to show the habitat and ecosystem of one organism that you learned about on the field trip. OR choose a family pet or a friends' pet and decide what their basic needs are and illustrate them on a poster.</p> <ul style="list-style-type: none"> <li>- Include drawings or pictures and descriptions.</li> <li>- Show how animals obtain these needs.</li> <li>- Compare their needs to your own or to that of another organism.</li> </ul>
<p><b>C.</b> Create a brochure: about what someone might need to know about a specific organism that you saw on the field trip.</p> <ul style="list-style-type: none"> <li>- Choose 1 – 3 living creatures to focus on.</li> <li>- Describe their habitat and life needs</li> <li>- Explain safety precautions that someone might need to consider if analyzing this organism.</li> <li>- List things to bring on such an excursion if you were to do for the first time.</li> </ul>	<p><b>D.</b> Write a story: about a day in the life of one organism that you learned about/observed on the field trip.</p> <ul style="list-style-type: none"> <li>- Explain how they get the things they need to live.</li> <li>- Include their perspective on the world.</li> <li>- Discuss challenges they may face.</li> <li>- Include their interactions with the world.</li> <li>- Depict their home and habitat.</li> <li>- <i>*(Extra):</i> Explain their life cycle.</li> </ul>

### Yeast Exploration Observation Sheet

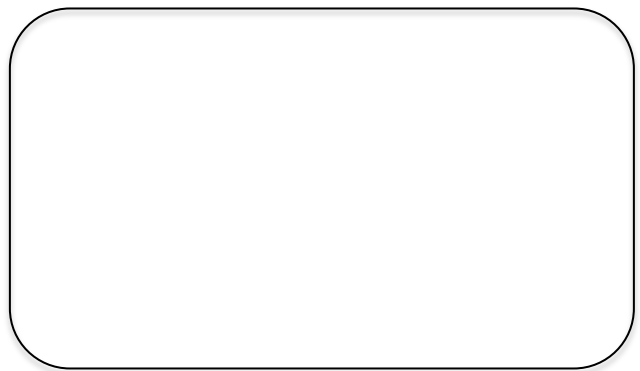
Name of Group Members: \_\_\_\_\_

Team Leader: \_\_\_\_\_

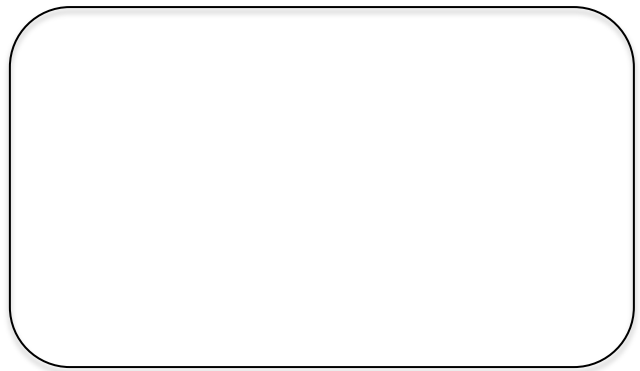
**Research Question:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Observations/Steps Taken:

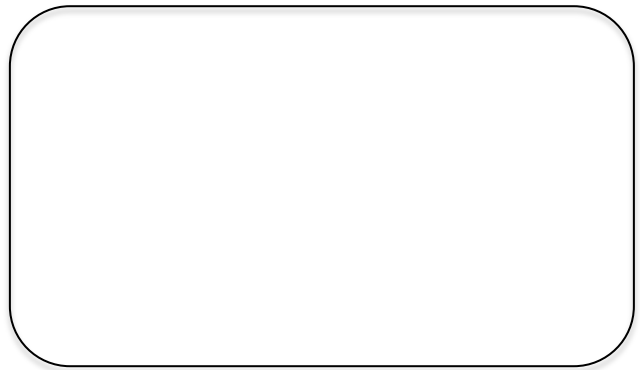
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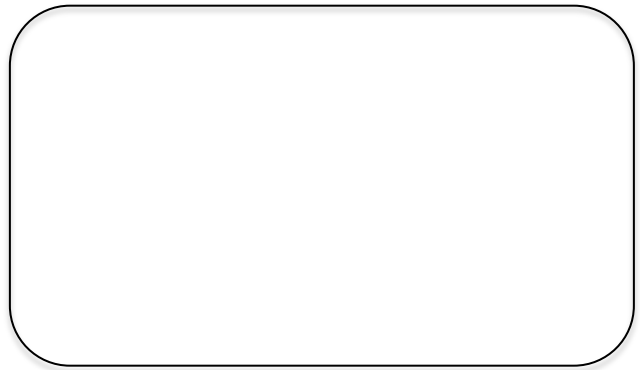
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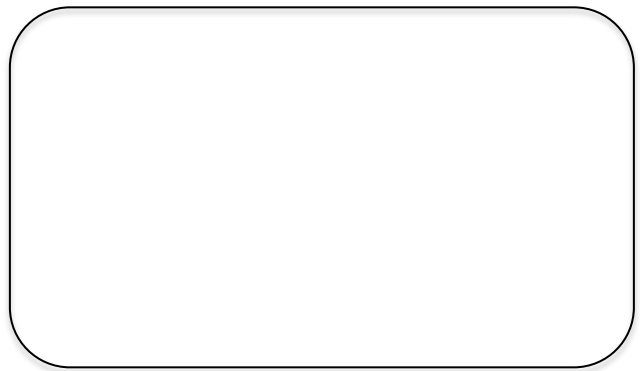
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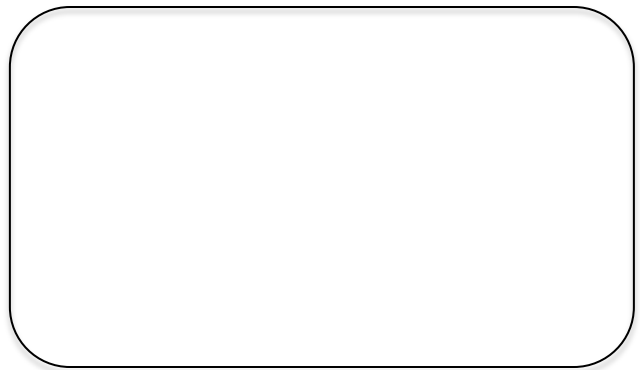
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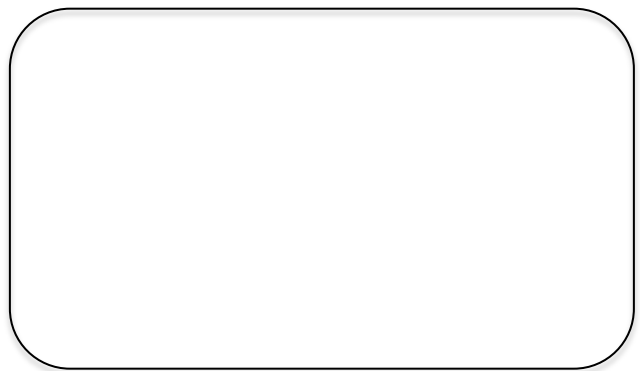
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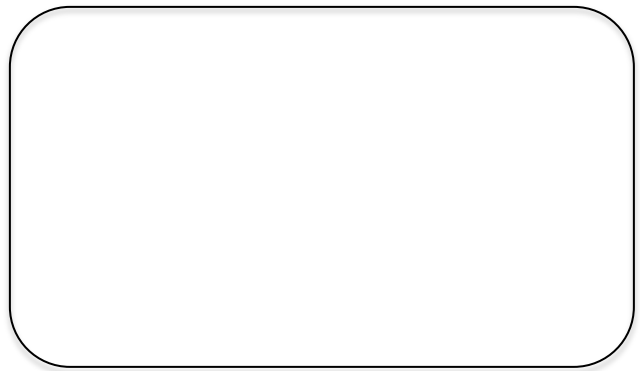
6. \_\_\_\_\_  
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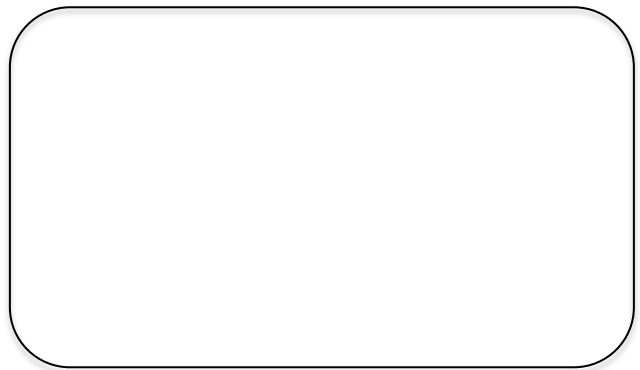
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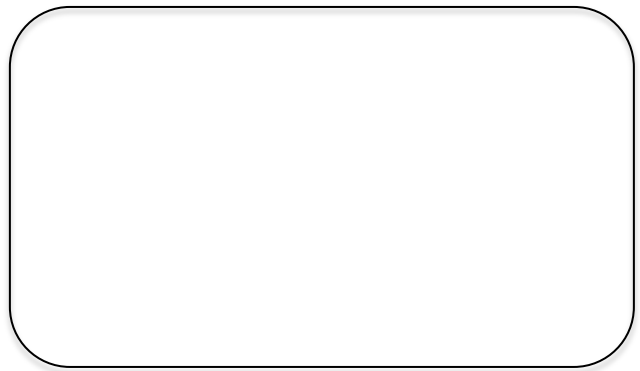
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10. \_\_\_\_\_  
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**\*If additional space is needed please use the back of this sheet.**

**\*\* If you would prefer to write your steps and lab report on loose leaf please feel free to do so.**