# Grade Three Science

## Aligned to Alberta Curriculum

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The lessons and experiments in this book fall under 5 main topics that relate to the Alberta curriculum for Grade 3 Science – Topic A: Rocks and Minerals, Topic B: Building with a Variety of Materials, Topic C: Testing Materials and Designs, Topic D: Hearing and Sound and Topic E: Animal Life Cycles. In each lesson you will find teacher notes designed to provide you guidance with the learning intentions, the success criteria, materials needed, a lesson outline, as well as provide some insight on what results to expect when the experiments are conducted. Suggestions for differentiation or accommodation are also included so that all students can be successful in the learning environment.

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# AT A GLANCE

| Skills: Science Inquiry |
| --- |
| ***3.1*** Investigate the nature of things, demonstrating purposeful action that leads to observation and inferences. Students will ask questions that lead to exploration and investigation and identify possible answers to questions from themselves and others. |
| ***3.2*** Identify patterns and order in objects and events studied; and, with guidance, record observations, using pictures, words and charts; and make predictions and generalizations, based on observations. Students will carry out procedures, identify materials and how they are used and access with guidance information and ideas from sources. |
| ***3.3*** Investigate a practical problem, and develop a possible solution. Students will identify applications of what has been learned, identify new questions that arise from investigations and development of solutions to problem, identify the purpose of an object to be constructed, use various strategies to complete tasks, communicate results of construction activities and evaluate the product in terms of accomplishing goals and opportunities for improvements. |
| **Attitudes** |
| ***3.4*** Demonstrate positive attitudes for the study of science and to the applications of science. Students will show growth in acquiring and applying curiosity, inventiveness, perseverance, appreciation of the value of experience and observation, a willingness to work with others, a sense of responsibility for actions taken and respect for living things and environments with a commitment for their care. |
| **Topic A: Rocks and Minerals** |
| ***3.5*** Demonstrate knowledge of materials that comprise Earth's crust, and demonstrate skills in classifying these materials. Students will compare samples of various kinds of rocks identifying similarities and differences, classify and identify sample rocks or minerals by properties that match a given description of the properties of a rock or mineral (such as the colour, shininess, dullness, texture, hardness, patterns or crystal qualities and presence of carbonates through testing with a mild acid like vinegar), recognize and describe various components within rocks and soil, describe and demonstrate ways in which rocks may break down to become soil and describe common uses of rocks and minerals with examples at school, home or in the local community. |
| **Topic B: Building with a Variety of Materials** |
| ***3.6*** Use, safely, a variety of tools, techniques and materials in construction activities. Students will design, construct and test structures using a variety of materials that are intended to support objects, span gaps and serve as models for particular objects or buildings, use a variety of methods to join or fasten materials together and maintain and store materials and tools safely and properly. |
| ***3.7*** Construct structures using a variety of materials and designs, and compare the effectiveness of the various materials and designs for their intended purposes. Students will understand that simple designs are often as effective as more complex ones, recognize the importance of good workmanship while demonstrating growth toward good workmanship and explain how knowing the intended purpose and use of structures help guide project decisions. Students will explain their choice of materials and apply skills of listening, speaking and cooperative decision making in working with other students on a construction. |


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| Topic C: Testing Materials and Designs |
| --- |
| ***3.8*** Evaluate the suitability of different materials and designs for their use in a building task. Students will recognize that functional structures must be sufficiently strong and stable while unstable and weak structures are often unsafe to use, compare and evaluate the strength and stability of different models or objects constructed, describe distinctive properties of materials that make them suitable building materials, apply procedures to test the strength of materials or test designs or test different methods of joining materials and identify and apply methods for making a structure stronger and more stable. |
| **Topic D: Hearing and Sound** |
| ***3.9*** Describe the nature of sound, and demonstrate methods for producing and controlling sound. Students will identify examples of vibration, recognize that sound is the result of vibration as well as recognize that the larger the vibration the larger the sound, recognize ways of measuring loudness to help understand when loud sounds pose a danger to hearing, recognize that pitch is the result of differences in the rate of vibration, predict how a change in the rate of vibration will affect a sound, demonstrate a variety of ways of producing sounds and construct and evaluate different kinds of soundproofing and sound-amplifying devices. Students will describe how the human ear senses vibrations, compare the range of hearing in humans to that in other animals, recognize and identify characteristics of sounds that cause them to be interpreted as pleasant or unpleasant, describe changes in hearing that result from continued exposure to loud noise and explain the role that sound plays in communication. |
| **Topic E: Animal Life Cycles** |
| ***3.10*** Describe the appearance and life cycles of some common animals and identify their adaptations to different environments. Students will classify animals based on observable characteristics, observe the growth and development of a living animal as the animal develops from early to more advance stages, predict next stages in growth and development of animals from understanding their current stage of growth. |
| ***3.11*** Identify requirements for animal care. Students will identify the food needs of animals, describe changes in how each animal obtains food through different stages, demonstrate awareness that prenatal care is characteristic of some animals and not of others through identifying examples of different forms of prenatal care, demonstrate awareness that animals require different habitats to meet their basic needs of food, water, shelter and space, recognize adaptions of animals to their environments, identify changes in its relationship to its environment throughout its life, identify environmental conditions that may threaten or have threatened animal survival, recognize that habitat preservation can help maintain animal populations and identify ways student actions can assist habitat preservation. |

***Taken from the Alberta Education Grade 3 Science Curriculum.***

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# TOPIC D: HEARING AND SOUNDS: PITCH AND VIBRATION

## Learning Intention:

Students will learn how vibration is created to make high and low pitched sounds that the human ear can hear.

## Success Criteria:

- demonstrate how vibration is made in order to create sound
- demonstrate how low and high pitched sounds are made
- describe how eardrums vibrate when sound reaches them
- gather and record findings about vibration and pitch using drawings and written descriptions
- make conclusions about the sounds caused by vibrations, and the pitch of sounds

## Materials Needed:

- a copy of ***Good Vibrations!*** Worksheet 1 and 2 for each student
- a piece of wax paper, a piece of newspaper, a piece of a plastic bag, a piece of tissue paper each 5 cm x 10 cm, a plastic comb (a set for each student)
- a copy of ***Making an Ear*** Worksheet 3 and 4 for each student
- a glass, a piece of wax paper, an elastic, salt, a marker (a set for each student)
- a copy of ***Pitch*** Worksheet 5 and 6 for each student
- four glass baby food jars, water, a drumstick or other stick (a set for each student)
- pencils, pencil crayons

## Procedure:

***This lesson can be done as one long lesson, or be divided into shorter lessons.**

1. Discuss with students the meaning of vibration. Students will conduct an experiment to find out how vibrations are created in order to make sound. Give them Worksheet 1 and 2, and the materials to conduct the experiment. Read through the materials needed, and what to do sections with them. They will conduct the experiment, record observations, and make a conclusion about vibrations.

2. Students will investigate how eardrums vibrate when sound reaches them. Give students Worksheets 3 and 4, and the materials to conduct the investigation. Read through the materials needed, and what to do sections with them. Students will conduct the investigation, record observations, and make a connection to the human eardrum and how it vibrates to send a message to the brain.

3. Discuss with students the meaning of pitch. Students will conduct an experiment to find out how pitch variations are created. Give them Worksheets 5 and 6, and the materials to conduct the experiment. Read through the materials needed, and what to do sections with them. They will conduct the experiment, record observations, and make a conclusion about how pitch variations are made.

## Differentiation:

Slower learners may benefit by working together in a small group, with teacher direction, in order to complete the experiment on Worksheet 1 and 2. Each group member could be given a material to test, then share results with other group members in order to complete the observations and conclusion on Worksheet 2.

**For enrichment**, faster learners could work in a small group to invent a song on their xylophones, and then perform it for the rest of the class.

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Worksheet 1

Name: _____

# Good Vibrations!

When something vibrates, it moves back and forth very quickly. Sound happens when an object vibrates. The more an object vibrates, the louder the sound it makes. Let's experiment with vibration!

## Materials Needed:

- a plastic comb
- about 5 cm x 10 cm of each:
    - a piece of wax paper
    - a piece of newspaper
    - a piece of a plastic bag
    - a piece of tissue paper

## What to do

1. Pick a material and fold it over the middle of the comb.
2. Place your mouth over the paper on the toothed side. Hum into the paper like you would hum into a kazoo.
3. Repeat Step 2 using the other materials.
4. Record your observations on Worksheet 2.
5. Make a conclusion about what you observed.
6. Make a conclusion about what you observed.



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Worksheet 2

Name: _____

## Let's Observe

What happened when you hummed into the comb?

_____

_____

_____

_____

_____

_____

It looked like this:

Which material made the loudest noise?

_____

Which material made the softest noise?

_____

## Let's Conclude

Circle the right answer.

The kazoo makes sound because the material:

**screams** **vibrates** **rolls up**

How did the different materials change the sound of the kazoo?

_____

_____

_____

_____

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Worksheet 3

Name: _____

# Making an Ear

We know that vibrations produce sound. Let's investigate how our eardrums vibrate when sound reaches them.

## Materials Needed:

- a glass
- a piece of wax paper that can cover the glass opening
- an elastic
- salt
- a permanent marker

## What to do

1. Using the permanent marker, write "eardrum" on the wax paper.
2. Cover the glass opening with the wax paper. Fasten the wax paper over the glass with an elastic.
3. Sprinkle the salt on top of the wax paper.
4. Say "ahhh" over the glass. Record your observations.
5. Make a connection about what you observed.



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Worksheet 4

Name: _____

## Let's Observe

What happened to the salt on the wax paper when you made a sound over the glass?

_____

_____

_____

_____

_____

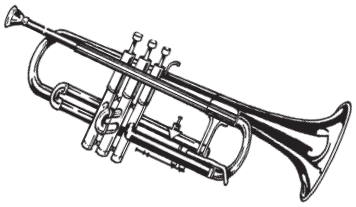
It looked like this:

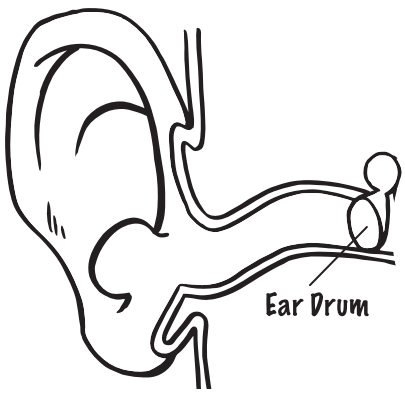
## Let's Conenct It!

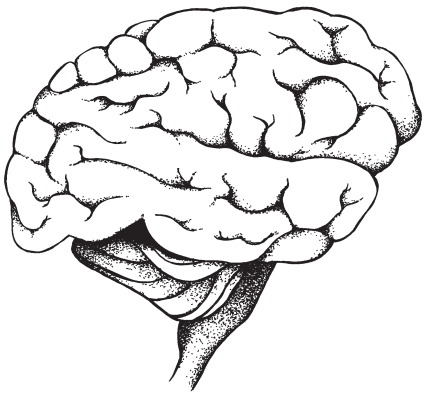
The eardrum inside your ear vibrates when you hear sounds. This sends a message to our brain, and we know that we heard a sound.

Sound travels from the horn to the brain. In the picture below:

- ❍ colour the eardrum blue
- ❍ draw a red arrow from the horn to eardrum
- ❍ colour the brain pink
- ❍ draw a green arrow from the eardrum to the brain





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