

Simply Marvelous

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Overview: Through the use of streaming video and Internet, students will learn to identify the six types of simple machines.

Grade Level: 3

Time Allotment: 2, 45 minute class periods

Subject Matter: Science and Technology

Learning Objectives:

Students will be able to:

- identify the six types of simple machines
- give an example of each of the six types of simple machines
- use tools to complete a task and explain how the task was made easier due to the tools

Standards:

- Virginia Standards of Learning
<http://www.pen.k12.va.us/VDOE/Superintendent/Sols/home.shtml>
3.2 The student will investigate and understand simple machines and their uses.

Media Components:

Video

- ***Simple Machines: A First Look*** Download only the clip entitled *Simple Machines: A Review* found at: <http://www.unitedstreaming.com> . To fully utilize this site, you must obtain a membership to United Streaming. You must also have installed one of the following free media players:

**Quicktime*

<http://www.apple.com/quicktime/>

**Windows Media Player*

<http://www.microsoft.com/windows/windowsmedia/download/default.asp>

Internet

- Matching Machines Construction Site
<http://personal.rockbridge.net/higs/sm/matching.htm>
This site is an online quiz your students will take in order to identify the six different types of simple machines.

Materials:

- Attached sheet of job slips, have enough jobs for each student to have one job

- Small basket to hold job slips
- One large bag of mixed nuts in their shells, enough to give each child at least one nut
- Nutcrackers, one per three or four students
- A computer projection device, for whole group presentation.
- One computer per every two students
- Attached graphic organizer, one per student
- Masking tape to tape job slips to board

NOTE: If you cannot provide enough nutcrackers and nuts for the students, butter knives and apples may be used instead.

Prep for Teachers:

- Cue clip. Since you downloaded only a small piece of the entire movie, you may start from the beginning, where the narrator says, "In this program we saw that work in the moving of something..." and you see a clothesline with clothes moving across it

Audio --"In this program we saw that work in the moving of something."

Visual--a clothesline with clothes moving across it

- Enlarge the graphic organizer to poster size
- Copy graphic organizer one per child
- Copy and cut apart the job slips. Put them into a basket
- Write the word YES in large letters on the board. Write the word NO beside it.
- Lay the masking tape close to the board for easy reaching
- Bookmark Web site, The Simple Machine's Construction Web Site. Preload each computer with the quiz <http://personal.rockbridge.net/higs/sm/matching.htm> for the students. Minimize the window so that it is not visible until needed.
- Pre load The Simple Machine's Construction Web site to the quiz on the computer that you will use for demonstration purposes, <http://personal.rockbridge.net/higs/sm/matching.htm> and connect to a computer projection device to demonstrate the quiz. Minimize the window so that students can not see it until you are ready.
- Lay the nutcrackers and nuts close by but out of sight of the students
- When using media, provide students with a focus for media interaction, a specific task to complete and/or information to identify during or after viewing of video segments, Web sites, or other multimedia elements.

Introductory Activity: Setting the Stage

Step 1: Say, "Today students we are going to be talking about work and how simple machines can help us with our work. What is work? (a force that causes motion) Since we are unclear about what work is, let's find out. I am going to pass around a basket that has some slips of paper that have jobs and activities listed on them. (See attachment for job slips.) Without looking, choose one of these slips of papers. I will call you up one at a time and you can act out

your job or activity. We will try to decide if you are doing work or not. If we think what you act out is work we will tape it on our board under where I have written 'Yes'; If we do not think it is work, I will tape it under where I have written 'No'. Remember, work is anything that requires movement. Let's begin."

Step 2: Call on students to go to the front and have them act out their job or activity. Each child acts out the job he or she pulled from the basket without saying anything out loud as if they were playing a game of charades.

Step 3: Allow the rest of the class to guess what the performing child is acting out. Then ask the students to decide whether they feel the action performed would be considered work. (All of the jobs slips are considered to be work but students will not realize this at this time.

Step 4: Tape the slip of paper on which the job was written to the board under the students' predictions.

Step 5: Ask, "Do we all agree with where we have put our job slips?" Say, "Well, I will let you in on a little secret. Actually all of these actions would be considered work. Work is a force, which causes motion. So any time something is moved, work is being done."

Step 6: "Now I have another job for you to do." Pass out nuts. Do not hand out the nutcrackers. Say, "I want you to crack open these nuts. Is there anyone who can crack open his or her nut? It is pretty hard to do with just your hands."

Step 7: Pass out the nutcrackers. Say, "I have just given you something that should make cracking nuts a little easier. Does anyone know what it is called? (nutcracker) Yes, it is a nutcracker. However, it has another name too. It is one of six simple machines. Simple machines are machines that we use everyday. We've gotten so used to using them that we sometimes take them for granted. I want you to use your nutcracker to crack open your nut. If you want to, you may eat the nut inside. Without this simple machine doing work for us, we would have a very hard time getting to those nuts inside their shells wouldn't we? (Allow a few minutes for students to experience the task of cracking their nuts open with the nutcrackers. Walk around the room to help as needed.)

Step 8: Say, Now that we have discussed what work is and used a simple machine to help us actually do work, let's take a closer look at some other simple machines and how these machines help us out everyday."

NOTE: If you cannot provide enough nutcrackers and nuts for the students, butter knives and apples may be used instead.

Learning Activities

Step 1: Introduce the **Focus for Media Interaction:** Ask, "Did you know that there are six different kinds of simple machines? Does anyone know what kind of simple machine the nutcracker is?" (Accept all answers) Say, "Even though we know a lot about work, and we know that machines help us, we don't seem to know the names of the six different types of simple machines that allow us to do our work a lot easier. Let's watch this video piece and I want you to listen for the names of the six different types of simple machines." **Play** video where the narrator says, "In this program we saw that work in the moving of something." and you see a clothesline with clothes moving across it.

Audio --"In this program we saw that work in the moving of something."

Visual--a clothesline with clothes moving across it

Step 2: **Stop** video when it ends. Ask, "What are the six types of simple machines?" Say, "So that we make sure that we don't miss anything, let's rewind and watch the clip again." **Focus for Media Interaction:** "See if you can name all six types of simple machines on your own after you hear them again and the video clip is over."

Replay the clip and watch again.

Audio --"In this program we saw that work in the moving of something."

Visual--a clothesline with clothes moving across it

Ask, "What are the six types of simple machines? (lever, wheel & axle, pulley, wedge, inclined plane, screw) This time I will list them on the board so that we all will remember them. Raise your hand and when I call on you, you can name one of the six machines that you saw on the video. I want you to fill them in the circles on your graphic organizer that I will give you now. I have a copy of the graphic organizer that I have enlarged. It looks just like yours. I will list them on my copy of the graphic organizer as you list them on your copy. " Pass out the attached graphic organizer. Call on students to name the simple machines. List the six machines on the board as students name them. Say, "I am going to walk around and check to see if you have all of your graphic organizer filled in." Check students' papers for accuracy. They will need these for the next part of the lesson.

Step 3: Say, "Now that we know the six different types of simple machines, let's see if we can decide how they can make our work easier. We are going to walk around the school playground. I want you to look for each of these simple machines. Remember that simple machines make work easier and work is anything that requires motion. As you find examples of each type of simple machine, write them down on the line under the type you think it belongs to." Take children outside and allow them to look around the playground for the six different simple machines. Give enough time for students to look around and provide assistance as needed if students have difficulty locating all six types of machines. Some examples you may have them find would be a slide, which is an inclined plane. A swing is a wedge. A merry-go-round could be considered to be a wheel and axle. Some playgrounds have poles that students can slide down. If the pole is a spiral it is easy to see this as a screw. A see-saw is a simple lever. The hardest machine to spot is the pulley. After sufficient time has been given, bring students back inside. Say, " Let's look at our graphic organizers again. As you raise your hand, I will call on you. You may give me one example of a simple machine you saw outside. I only want you to give me one example so that everyone can have a chance. As you give me an example I will write it on my organizer. If someone gives an example you do not have, you may want to fill in their example on your organizer as well." Call on students and write their examples down on the large graphic organizer. Ask, "Who remembers what work is? (any force which requires motion) Why do we use simple machines? (to make work easier) What are the six different types of simple machines?" (lever, wheel & axle, pulley, wedge, inclined plane, screw)

Culminating Activity

Step 1:

Provide a **Focus for Media Interaction**. Say, “Now that we know what the names are of the six simple machines, you are going to take a simple quiz on the Internet to see if you can identify the six types of simple machines. Your quiz has already been preloaded so all you have to do is maximize your window. I will demonstrate how to maximize my window on the projector.” Demonstrate for the students how to maximize their windows so that the quiz on <http://personal.rockbridge.net/higs/sm/matching.htm> is showing. Say, “ You will be working with a partner. Read each question carefully and look at the picture. Choose the best answer and click in the circle beside the best answer. You and your partner may discuss quietly between the two of you which answer you think is the correct choice. When you are finished, click on 'submit' and the quiz will be graded by the computer site. Once your quiz has been graded, raise your hand. If you have gotten all of your questions correct, I will put a happy face on your graphic organizer. Now you may begin.” As students take the quiz, walk around and assist as needed.

Cross-Curricular Activities:

Language Arts: Download and print out The Time Machine by H. G. Wells located at <http://www.citsoft.com/time.html> Copy a classroom set and put inside clear plastic report covers. Read with the class. Students may illustrate the story as you read it.

Social Studies: Research and make a class timeline of all the important machines that have been invented during the past 50 years. Also, inventors of these machines could be researched.

Math: Graph how many of each type of machine the students found on the playground and around school.

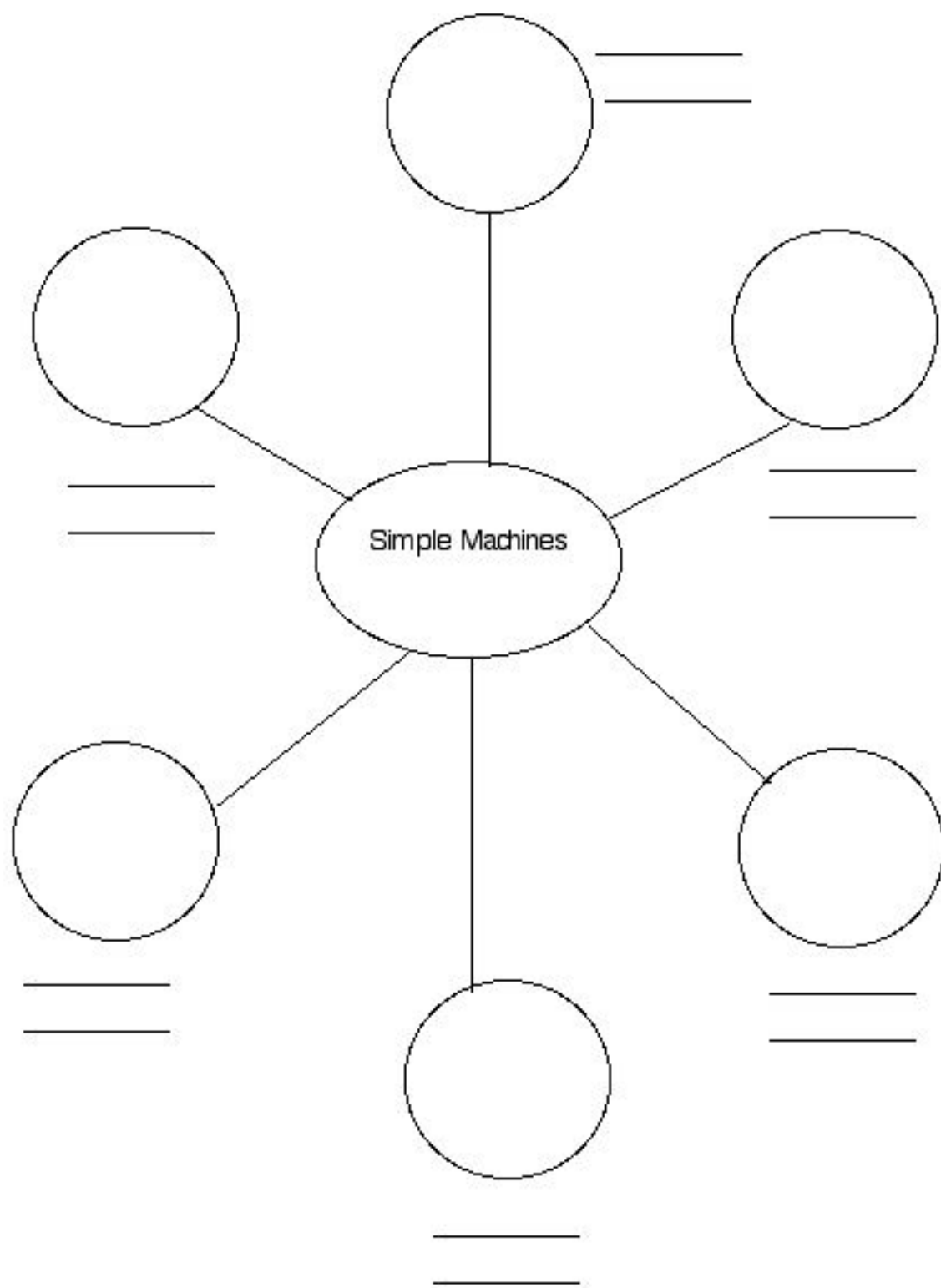
Science: Expand the science lesson by allowing students to complete the entire simple machine web quest entitled, The Simple Machines Construction Site <http://personal.rockbridge.net/higs/sm/machines.htm>
To remediate students, teachers could pick and choose parts from this web quest for students to review or work on again.

Art: Students could draw their own fantastic machine created out of simple machines. The Simple Machines Construction Site has a museum, which will display pictures drawn by students.

Technology: Students could put together a slide show displaying the class’s pictures of fantastic machines.

Community Connections:

- Visit a storage yard for VDOT trucks. (Virginia Department of Transportation) Have someone at VDOT point out how simple machines are fitted together to make a compound machine.
- Or have a carpenter come into the classroom to show off their tools. Perhaps, the carpenter could even demonstrate how to put together a bookshelf, which could be used in the classroom.



eating	sleeping
riding your bicycle	reading a book
watching <u>Reading Rainbow</u> on television	brushing your teeth
writing a story	skateboarding
taking out the trash	playing with your friends in the park
getting dressed for school	dancing

playing on your
playstation

taking a test in
science

climbing
a tree

swimming

cleaning out your
closet

hugging your
grandmother

hiking in the
woods

doing your
homework

washing your
dad's car

sweeping the
driveway

blowing out
candles on a cake

saying the pledge to
the flag

raking leaves in
the fall

shoveling snow in
the winter

drinking a soda

playing kickball at
school

playing kickball at
home

baking a cake

combing your
hair

tying your
shoelace

watching a
movie

babysitting your
little brother

walking the dog

cleaning the cat's
litter box

