

MAGNIFICENT MACHINES

UNIT OVERVIEW

"Hands-on" is definitely the order of the day as students inquire into and investigate the magnificent world of machines. Student notes explain the six simple machines (inclined plane, wedge, screw, lever, wheel and axle, pulley). Related teacher demonstrations and simple-to-do student activities and discovery sheets accompany these core lessons. Student notes are included for possible enrichment lessons dealing with gears, hydraulics, and how a car works. More involved, optional assignments stress creative and critical thinking in addition to building a degree of flexibility into the unit. From now on, teaching about machines will no longer be mundane - it will be magnificent!

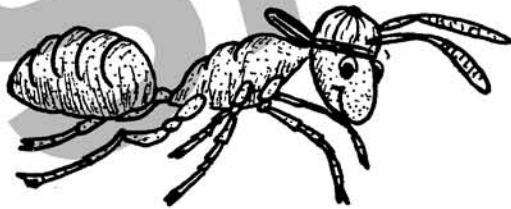
STUDENT ASSIGNMENTS AND ACTIVITIES

1. **Introductory Lesson** - Machines Wordsearch
2. **Inclined Plane** - Army Builds A Pyramid - Ant Hill Gang Discovery Sheet
3. **Wedge** - Machine Collage
4. **Screw** - Amy's Way Home - Ant Hill Gang Discovery Sheet
5. **Lever** - Lever Fever - Ant Hill Gang Discovery Sheet
6. **Wheel and Axle** - Water From The Well - Ant Hill Gang Discovery Sheet
7. **Pulley** - Pulley Power - Ant Hill Gang Discovery Sheet
8. **Gears and Hydraulics** - Machines at Work - Identifying Simple Machines
9. **How A Car Works** - Crazy Cars - Enrichment Crossword

OPTIONAL ACTIVITIES

1. **Review**
2. **Lazzzy!**
3. **Useless Invention**
4. **Famous Inventor Report**
5. **Machine Pictograms**

"Ant Hill Gang"



ANT HILL GANG DISCOVERY SHEETS

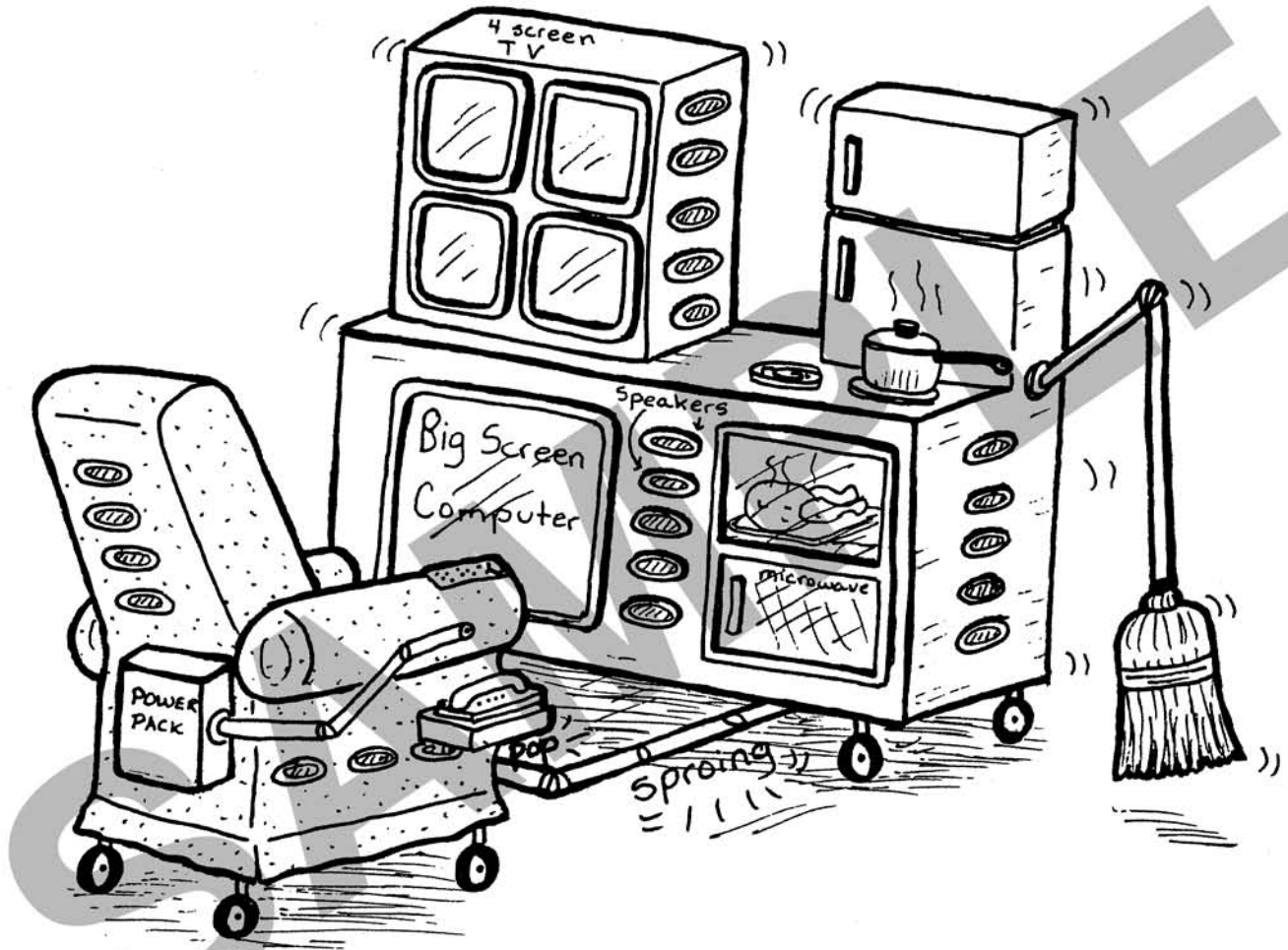
The Ant Hill Gang and the related discovery sheets help to motivate students with hands-on problems that students help to solve. Throughout the unit, various concepts are approached by having students develop and build solutions using their knowledge of machines to help out the members of the Ant Hill Gang. Army the Ant needs help building a pyramid, Amy (Army's kid sister) needs a spiral built to help get home, Alice Ant needs help moving a large boulder, Albert needs help getting water out of the well, while Adam Ant needs help getting friends up a steep cliff. The discovery sheets contain hands-on instructions for students on how to build devices that can get the job done and make learning enjoyable at the same time.

LAZZZY!

Name: _____

Instructions: Design and draw a contraption that will help a person who is lazy. Do a rough draft of your device on scrap paper. Colour your design. Describe how your contraption works by listing the steps at the bottom of the page.

NAME OF CONTRAPTION: _____

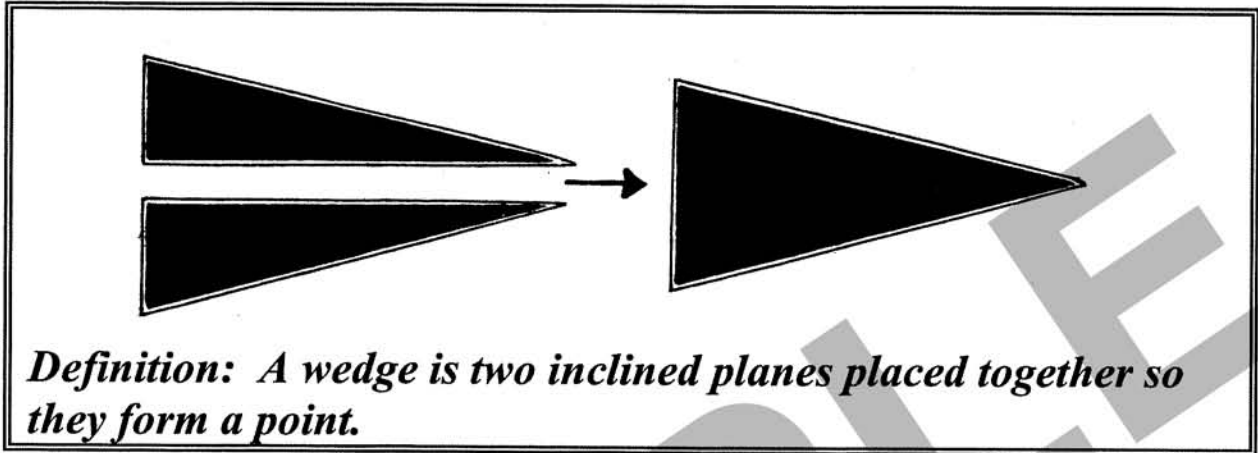


HOW THIS CONTRAPTION WORKS

- | | |
|----------|-----------|
| 1) _____ | 2) _____ |
| 3) _____ | 4) _____ |
| 5) _____ | 6) _____ |
| 7) _____ | 8) _____ |
| 9) _____ | 10) _____ |

Wedge

Early humans used stone scrapers to scrape and split animal skins. These crude stone tools were actually wedges made by chipping special types of rock into sharp, cutting instruments.

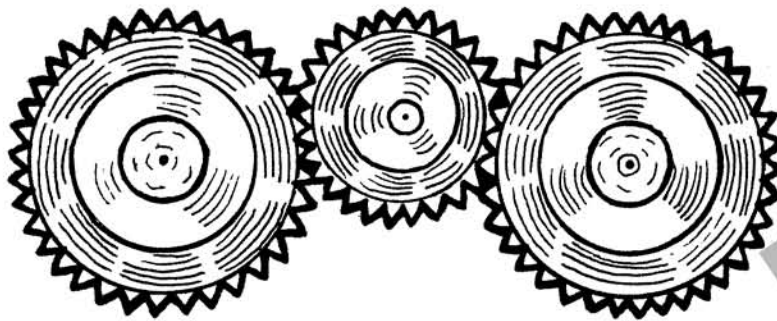


Wedges work by focusing all of the force, work or energy put in at the back of the wedge, onto the tiny sharp point at the front of the wedge. All this force focused onto a small point can make tasks that seemed impossible, simple and easy.



Gears

Even though gears are not one of the six simple machines, they are found in many modern machines.



Definition: Gears are wheels with cogs (teeth) that mesh together.

One way that gears work is by changing the direction of spinning. For example, in a car transmission, the gears change the spinning direction of the drive shaft so that it will turn the axle and tires.



A second important use of gears happens when a small gear is turned by a large gear. When the large gear turns once, the smaller gear turns many times and must spin faster. This is how the gears on a bicycle work. (Wheels connected by belts also work this way)

