

## SIMPLE MACHINE PLAYGROUNDS

Name \_\_\_\_\_ Date \_\_\_\_\_

1. The completed playground must fit on a student desk.
2. All working parts must be labeled.
3. Transform all simple machines into working parts of equipment:  
**a) pulley b) lever c) wedge d) inclined plane e) screw f) wheel and axle g) gear.**
4. Lever must be adjustable for different weights to balance. (Heavy weight must be able to balance a light weight.) You must also explain how that can happen.
5. You may select any theme you want for your playground:  
 jungle, beach, beauty shop, desert, prison, water park, car repair garage, haunted house, backyard, basement, airport, circus, schoolyard, dentist's office. *\*Bonus for an original any other theme, use it as long as it is G-rated.*
6. The Park Sign must include either your **first or last name** (or recognizable nick-name) and also incorporate **the theme**. You may not use copyrighted names, such as Disney world. Create an original name. Example: David's Deserted Desert
7. The playground must have these things: places for **litter, safe surfaces, and rules** for playground use.
8. The simple machine playground must be built from recycled things you get permission to use.
9. When you present your playground you must be able to do these things:
  - a) Explain force and work using each invention.
  - b) Show how gravity is used.
  - c) Show three examples of effort.
  - d) Show three examples of resistance
  - e) Name and explain how each simple machine is used.
  - f) **Remember: Machines do not reduce the amount of work. They reduce the amount of effort.**
10. Explain and show how safety became part of your building plan of the playground.
11. Explain and show how safety became part of the playground rules.
12. Optional parts may be included: Picnic or eating areas, trees, fountains. or anything else you choose. *\*If you use real water, make sure there are no leaks.*
13. Due date: Tuesday, \_\_\_\_\_ You may earn bonus points by bringing it on Monday, \_\_\_\_\_. Late deduction: 25 points.

### Scoring Rubric for Simple Machine Playground

Does the completed playground fit on a student desk? \_\_\_\_\_

Project completed on \_\_\_\_\_ (date) : \_\_\_ on time, early \_\_\_ bonus, late \_\_\_ deduction

Are all working parts labeled? \_\_\_\_\_

**Have you transformed each simple machine into working parts of equipment:**

\_\_\_\_\_ a) pulley \_\_\_\_\_ b) lever \_\_\_\_\_ c) wedge \_\_\_\_\_ d) inclined plane \_\_\_\_\_ e) screw  
 \_\_\_\_\_ f) wheel and axle \_\_\_\_\_ g) gear.

Is the **lever** adjustable for different weights to balance. (Heavy weight must be able to balance a light weight.) \_\_\_\_\_ Can you explain how that can happen using the words load, balance, fulcrum, and effort.

**Theme** of playground \_\_\_\_\_ Was it effectively carried throughout? \_\_\_\_\_ Was it G-rated. \_\_\_\_\_

**Park Sign** include either your first or last name (or recognizable nick-name) \_\_\_\_\_ Is the theme part of the sign? \_\_\_\_\_ Do it use copyrighted names, such as Disney world. \_\_\_\_\_

Are there places for litter? \_\_\_\_\_, safe surfaces? \_\_\_\_\_ rules for playground use? \_\_\_\_\_

Is it built from **recycled things** you get permission to use? \_\_\_\_\_

When you present your playground you must be able to do these things:

- Explain force and work using each invention.
- Show how gravity is used.
- Show three examples of effort.
- Show three examples of resistance using two different machines.
- Name and explain how each simple machine is used.
- Remember: Machines do not reduce the amount of work. They reduce the amount of effort.

**Optional parts** may be included: Picnic or eating areas, \_\_\_\_\_ trees, \_\_\_\_\_ fountains. or anything else you choose. \_\_\_\_\_ Other? \_\_\_\_\_ Leaks? \_\_\_\_\_

\*If you use real water, make sure there are no leaks.

Due: \_\_\_\_\_ Early \_\_\_\_\_.

Oral/diagram assessment: **Lever Job**

- Given Lego pieces listed below, build levers to show the following:
- Label the fulcrum, the forces. Be sure to show the holes in your drawings. Build a lever that balances by moving the weights into two different locations.
- Three sentence explanation of diagram using words on drawing.

Performance Objectives

The learner will:

- select and use the proper tools to construct a simple device.
- classify object according to their observable characteristics or functions (lever, pulley, ramp).
- use the scientific method to gather and record information about mechanical devices.
- use information about simple machines to make predications and inferences about other devices.
- manipulate objects to discover the relationship between the objects or the events (e. g. race car / inclined plane).

Instructional objectives:

The learner will:

- describe the functions of simple machines and explain how they make work easier.
- define and demonstrate the concepts of force, gravity, and friction as related to work and energy.
- describe how energy is used to accomplish work.
- recognize that a machine is a device for multiplying or changing the direction of force.
- manipulate everyday objects (e. g. broom, hammer, bottle opener) and explain what mechanical principle is involved in their use.
- use a selection of simple machines to create more complex machines.