

# Grade 4 Science

Lesson: 3-1

Unit: Pulleys and Gears

Topic: Introduction

## Lesson

- Provide small groups with picture showing pulley/gear use.
- Instruct groups to quietly read the paragraph at the top of the page.
- Groups then work to make a list of all the pulleys and gears they can find in the picture.
- Have groups take turns supplying answers → record on chart paper
- Ask groups to add their own ideas to the list of other things that use pulleys ~~and~~ or gears (add to chart paper)
- Give students a ~~big~~ blank piece of paper and have them make a title page for the unit → include the words "Pulleys" and "gears" as well as pictures.

## Reminders

## Supplies Needed

- Picture
- Chart Paper
- Blank Paper

## Homework

## Notes

# Grade 4 Science

Lesson: 3-2

Unit: Pulleys and Gears

Topic: Pulleys - Into Build

## Lesson

- Handout worksheet and read about picture
- Discuss activity, read through procedure
- Show students how to use a spring scale
  - don't play
  - don't fully extend
- Students begin activity
- At the end of class students clean up and place apparatus in a safe place.

## Reminders

## Supplies Needed

- |            |                       |               |              |
|------------|-----------------------|---------------|--------------|
| - String   | - Empty thread spools | - tape        | - Ruler      |
| - scissors | - skewers             | - Paper clips | - Worksheets |
| - weights  | - straws              | - Dowels      |              |

## Homework

## Notes

# Grade 4 Science

Lesson: 3-3

Unit: Pulleys and Gears

Topic: Pulleys <sup>into Build</sup> - Questions

## Lesson

- students are reminded of their task → build an apparatus that uses a pulley to lift
- students finish building and testing apparatus
- students then document their experiment using their worksheets.
- \* if students finish early have them check their answers to verify that they have fully answered the questions
- when done give students an additional challenge → be able to raise and lower mass without touching.  
from floor to desk height

## Reminders

## Supplies Needed

see previous lesson

## Homework

## Notes

# Grade 4 Science

Lesson: 3-4

Unit: Pulleys and Gears

Topic: Pulley Systems

## Lesson

- students document their work from the previous two classes (on their worksheet)

- when complete do a demonstration (direction and force)

\* do in the middle, then they get back to work

→ Fixed pulley

→ Movable pulley

→ Two pulley system

→ show double + triple, but do not setup



\* Talk about pulley systems  
→ they reduce needed force  
→ can alter direction  
→ Need more space

## Reminders

## Supplies Needed

- string
- mass
- spring scale
- 2 single pulleys
- double pulley
- triple pulley
- meter stick

## Homework

## Notes

# Grade 4 Science

Lesson: 3-5

Unit: Pulleys and Gears

Topic: Pulley Information

## Lesson

- Inform students that today they will be left to themselves to learn more about pulleys. The work is difficult, but they are encouraged to think their way through it.
  - It will not be marked
  - I will take it up at the end
- Hand out worksheets and instruct students to bring it to me when they are finished.
- Allow students to struggle a bit, providing some guidance to avoid frustration
- Discuss answers at end of class.
- \* If students are done, challenge them to build pulley system on back of page.

## Reminders

## Supplies Needed

- Worksheets
- String
- Spring scales
- Pulleys
- Masses

## Homework

## Notes

# Grade 4 Science

Lesson: 3-6

Unit: Pulleys and Gears

Topic: Pulleys

## Lesson

- Show and explain worksheet to students
- Hand out worksheet
- Students work independently on worksheet
- When complete students are to complete other work in their folders
- Take up answers at end of class

~~\* At class works,~~ set up a <sup>fixed, movable</sup> 3/3 pulley system.  
Show to class when done (use 1kg mass)

## Reminders

## Supplies Needed

- worksheets
- 3 pulley x 2
- 1000g mass
- string

## Homework

## Notes

# Grade 4 Science

Lesson: 3-7

Unit: Pulleys and Gears

Topic: Pulleys in Action

## Lesson

- Explain that we will be using the computers to look at some pulley systems today
- Have each student log in and guide them to webpage.
- Read through instructions as a class
  - stress that they answer some 6 questions about all 5 pulley systems
  - stress importance of reading all info → some pictures are just for show.
  - No video today.
- Students work until ~ 15 minutes left in class (we will continue next class)
- stop students, pack up.
- Hand out quiz review
  - read through
  - discuss

## Reminders

- Make sure webpage is set up

## Supplies Needed

- Computers
- Review sheets
- Worksheets

## Homework

## Notes

Hand out quiz review

Use computer → show pulley picture  
→ Answer questions  
- # of pulleys  
- Type of pulley  
- Mech Adv?  
- Direction  
- in/out?

# Grade 4 Science

Lesson: 3-8

Unit: Pulleys and Gears

Topic: Pulleys in Action 2

## Lesson

- Ask students if they studied
- Tell students to continue with their work.
- When done students verify answers with web answers and me.
- IF done, students may watch video at bottom of webpage.
- Once video is over, students use remaining time to study for upcoming quiz.

## Reminders

## Supplies Needed

- Computers

## Homework

## Notes

Play w pulleys

# Grade 4 Science

Lesson: 3-9

Unit: Pulleys and Gears

Topic: Playing With Pulleys

## Lesson

- Inform students that ~~today~~ we will be "playing" with pulleys
- Inform students that they have two options:
  - ① Make one of the pulley systems from last class
  - ② Explore multiple pulleys (i.e. double fixed, double movable)
- Remind students that they need to respect the equipment
- Students explore
- Clean up at end of class.
- Remind students of quiz next class

## Reminders

## Supplies Needed

- Variety of pulleys
- Play clay
- Tape
- String
- Popsicle sticks
- Paper clips

## Homework

## Notes

Pulleys Quiz

Grade 4 Science

Lesson: 3-10

Unit: Pulleys and Gears

Topic: Pulleys Quiz

**Lesson**

- Review quiz writing procedures.
- Hand out quizzes
- When students are done they are to work quietly on finish up work
- Ask students to bring in Lego men next class

**Reminders**

**Supplies Needed**

- Quiz

**Homework**

**Notes**

Gears