

Grade 4 Science

Lesson: 3-11

Unit: Pulleys and Gears

Topic: The Great Escape

Lesson

- Explain challenge to students * Be dramatic
 - Your group is ~~trapped~~ stuck on the roof of a ^{burning} building
 - Only escape is getting down from adjacent buildings
 - Have pulleys and supplies
 - Building will collapse in _____ minutes
 - Need to build escape route
 - * Buildings = desks 1 m apart (dark)
 - + Need to transfer toy people from one building to next, then down to floor without falling.
- Students plan and build escape in groups of 5 ish
- Students demonstrate escape at end of class.

Reminders

Supplies Needed

- | | | | | |
|-----------|----------|---------------|-------------------|------------|
| - Pulleys | - string | - Paper clips | - Popsicle sticks | - spools |
| - Tape | - Paper | - Play clay | - Skewers | - Lego men |

Homework

Notes




Grade 4 Science

Lesson: 3-12

Unit: Pulleys and Gears

Topic: Gear Info

Lesson

- Explain that we will be moving on from pulleys and starting gears today.
- Show and explain worksheet → students are to carefully read through information on front page
 - Students then answer questions on the back page.
- When students finish, they are to verify answers with a friend.
- Take up answers as a class at end of period
- Inform students that they need to bring corrugated cardboard next class → show examples of appropriate vs not cardboard

- Remind students who are re-writing quiz that it will be next class

Reminders

- Students re-writing their quiz will do so next class

Supplies Needed

- Worksheets
- extra study sheets

Homework

- Bring Cardboard next class

Notes

Grade 4 Science

Lesson: 3-13

Unit: Pulleys and Gears

Topic: Exploring Gears Prep.

Lesson

- Explain experiment to class
- Explain that today's period will be used to prepare gears and that tomorrow we will explore them
- Hand out cut-outs → students cut out gear shapes
- glue to cardboard
- * Inform students that shape has to be exact or they will not work → CAREFULLY cut them out
- students should label their gears with their name
- Collect all gears at end of class (students can leave them in their desk)
- * Students who are re-writing quiz do not make gears → partner with someone next class

Reminders

Supplies Needed

- Scissors
- Cut-outs

Homework

- IF time during lunch or other classes, finish cutting gears.

Notes

- * Can assign this task as HW during 3-12

Grade 4 Science

Lesson: 3-14

Unit: Pulleys and Gears

Topic: Exploring Gears - Experiment

Lesson

- Review experiment and show an example of how to set up
 - * one tooth touches one tooth
 - * Works best if make gap between desks and nail is pushed all the way down.
- Inform students that today is used for performing experiment, all work is to be done.
- Questions may be done next class
- Inform students that all nails are to be returned at end of class
- Clean up and keep gears in desk

Reminders

Supplies Needed

- Gears
- Nails
- Worksheets
- Cardboard

Homework

Notes

* gears slip, show how to turn properly

Grade 4 Science

Lesson: 3-15

Unit: Pulleys and Gears

Topic: Exploring Gears - Questions

Lesson

- Inform students that today is to be used for answering the questions from our previous experiment
- All students to work for $\frac{1}{2}$ period
- For 2nd half of period discuss answers
 - confirm understanding of tooth on tooth
 - show multiplication involved
 - 10 teeth \times 3 turns = 30 teeth
 - ∴ need 30 teeth from gear 2
 - if 1 turn then $1 \times \square = 30$
 - ∴ 30 teeth

Reminders

Supplies Needed

- Worksheets
- Nails
- Gears
- Cardboard

Homework

Notes

Grade 4 Science

Lesson: 3-16

Unit: Pulleys and Gears

Topic: Gear Questions

Lesson

- Review concept of gears moving ~~one~~ by teeth meshing, and each tooth touching another.
- Hand out worksheet.
- Students are to work independently of the sheet
- Take up answers at end of class

Reminders

Supplies Needed

- Worksheet
- Gears for examples
- Answers.

Homework

Notes

* Half class will do this, other 3-17, then switch

Grade 4 Science

Building with Gears

Lesson: 3-17

Unit: Pulleys and Gears

Topic: ~~Gears in Action~~

Lesson

- Show box of gear "toys"
- Explain to class that these are new and need to be used respectfully.
- Groups will be building the eggbeater on pages 10 and 11
- Remind groups to keep All supplies in bucket when not being used.
- Groups build.
- IF extra time, groups may explore other build options
- Provide a lot of time for clean up to ensure it is done properly.
- Discuss operation of egg beater as a group

Reminders

Supplies Needed

- Knex

Homework

Notes

Grade 4 Science

Lesson: 3-18

Unit: Gear Pulleys and Gears

Topic: Gears in Action

Lesson

- Show students worksheets and ask if it looks familiar
- Explain that today we will be doing an activity identical to the activity we did with gears.
- Have students go to webpage
- ~~Students~~ Hand out worksheets
- Students should be able to start without instruction
- After a few minutes students will be frustrated, stop them and explain each of the five gear systems (have them click on each as they are explained)
- Students then continue working
- Hand out review for quiz → explain that it is very similar to our pulleys quiz

Reminders

Supplies Needed

- Computers
- Worksheets

Homework

Finish worksheet at home.

Notes

Grade 4 Science

Lesson: 3-19

Unit: Pulleys and Gears

Topic: Bicycles

Lesson

- Explain that today's experiment will have to be done as one large group because of lack of equipment
- Bring out bike
- Hand out worksheets
- Talk through experiment (reading all first before doing anything)
- Have student volunteers perform each step of experiment
- Meanwhile, students should be recording info
- When done experimenting, students are to answer questions
- Remind students to study for quiz.

Reminders

Supplies Needed

- Worksheets
- Bicycle with gears

Homework

Notes

- Hide bike at start if possible

Grade 4 Science

Lesson: 3-20

Unit: Pulleys and Gears

Topic: Bicycles 2
~~Geo~~

Lesson

- Review experiment from last class
 - looked at different gears on a bike
 - watched for speed/# of rotations
- Inform students that today they are to answer the questions
- when done students are to finish up incomplete work or they may study for their quiz next class

Reminders

Supplies Needed

- bike (if available)

Homework

- Study for quiz

Notes