

# The Hammer

Name(s): \_\_\_\_\_

\_\_\_\_\_

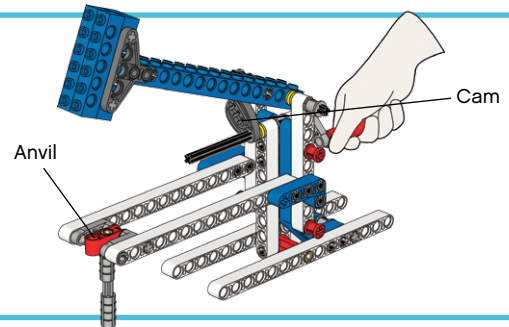
How can you make a hammer machine that makes it easy to hammer different nails into different surfaces? Let's find out!



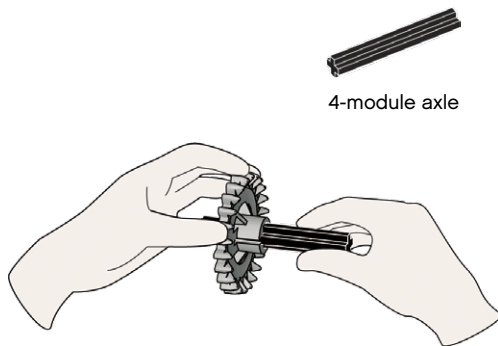
## Build the Hammer

(All of book 4A and book 4B page 11, step 14.)


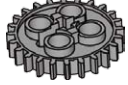

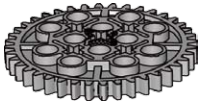
Make sure that the hammer lifts and drops smoothly. If it is too stiff, loosen the bushings and make sure all other elements fit tightly together.



Which gears have the most friction when tested by hand?

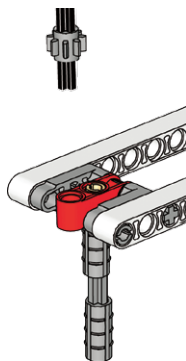


How much force is needed to push the axle through each gear?




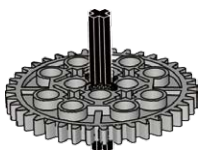
			
8-tooth spur gear	24 tooth	24-tooth crown gear	40-tooth spur gear

4 = most force, 1 = least force

Which gears have most the friction when tested by the hammer?



How many hits with the hammer are needed to push the axle through each gear?

			
8 tooth	24 tooth	24-tooth crown gear	40 tooth

Which is the better test system, and why?

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### Ballerina

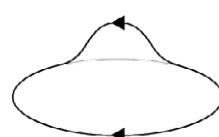
- Build the Ballerina, from book 4B to page 23, step 21
- Try out these cam shaft designs (dance program)
- Connect each cam shaft with one of the 4 'dance diagrams'



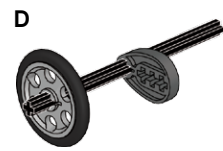
Dance diagram 1



Dance diagram 2



Dance diagram 3



Dance diagram 4



**Also try:**

- Amazing decorations
- Hiding your cams – can anyone guess your dance program
- Making the ballerina's arms wave
- Making your own cam profiles

### My Moving Sculpture

Draw and label your favourite moving sculpture or animated toy that uses cams. Explain how the best three parts work.