



Fishing Rod

Design and technology

- Using mechanisms – pulleys and levers
- Investigating a pawl and ratchet
- Designing and making a game

Science

- Forces
- Machines that make work easier
- Properties of materials
- Scientific investigation

Vocabulary

- Pulley block
- Ratchet
- Pawl
- Reel
- Effort
- Load

Other materials required

- Cardboard – big poster size (A2)
- Scissors
- Assorted colour markers

Connect

Jack and Jill are at a friend's birthday party with some other children. They are in the garden and they have been selected to catch fish in the new Fishing Pond.

They have great fun, when suddenly Jack catches the largest and heaviest fish in the pond. Even using all his strength, he can't reel in the heavy fish.

Jill gets an idea as to how to reel in the fish. What do you think she plans on doing?

**How can we make an exciting fishing device for Jack and Jill, and land the large fish?
Let's find out!**



Construct

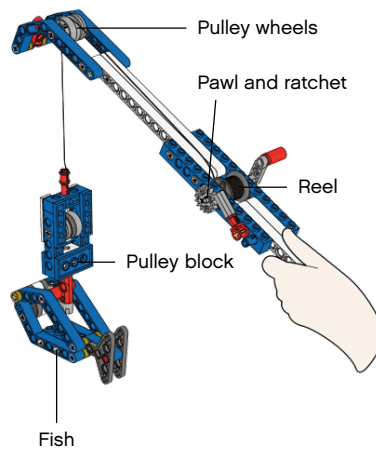
Build the Fishing Rod (including pulley block and fish)
(all of book 2A and book 2B to page 10, step 19).

Fine-tune your Fishing Rod

Loosen any overly tight bushings so that the reel and pulleys roll freely. If not, the tests will not work properly.

Test to see if you can catch the fish

You may need several attempts.
Have a go at catching it and letting it off the hook again.



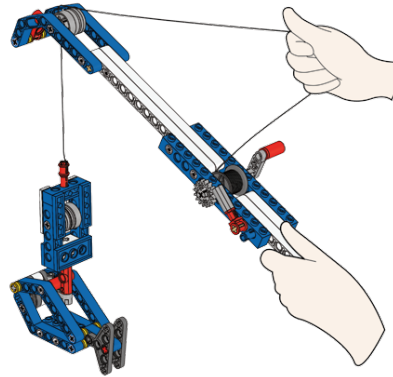
Contemplate

Why use a reel and ratchet?

Try first lifting the large fish by simply pulling on the line. Then lift using the reel. What do you notice?

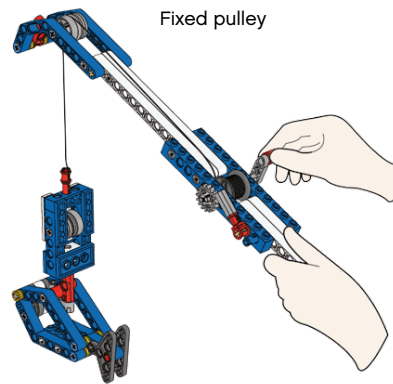
Try the pawl and ratchet safety system (page 10, step 19).

What are the advantages?

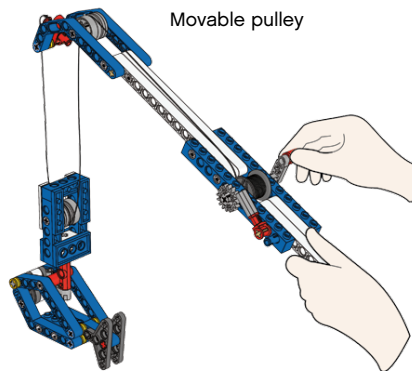


What difference does an extra pulley make?

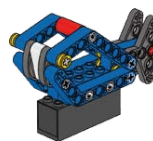
Set up the Fishing Rod as illustrated here. Predict and test which effects this might have when landing fish?



String up the pulley block as shown on page 11, step 20. Predict and test what effects this setup might have when landing the fish?



Add a load (the weight element) to the fish and test again with your Fishing Rod. Find out which is the easier way to land the heavy fish.



Did you know?

Big cranes use this system to lift heavy loads with small motors. Some pulley systems use up to six or more pulley wheels!

Did you know?

The weight element contains steel plates and weighs exactly 53 g!

Continue

Design and make your own Crazy Fishing Game

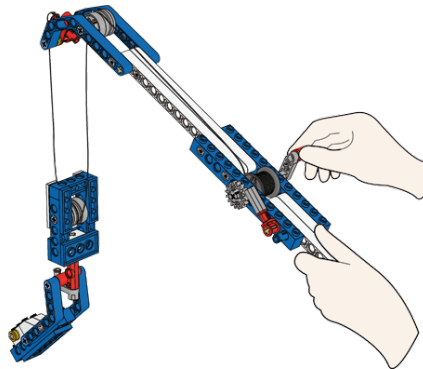
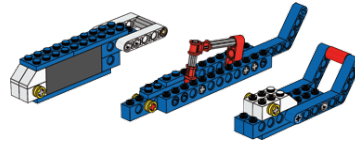
In the shortest possible time catch as many 'fish' as you can.
Build a variety of 'crazy fish' as shown. Invent more of your own. Maybe you can make them look more like real fish?

Hook them and see which are easy and which are more difficult to catch.

Agree on rules and a 'scoring system' for your fish. Which designs would trigger a higher score if a fish is landed?

Play a game 'against the clock'. What score did you get in 60 seconds?

Try again. How much did your score improve with the second, third, ... attempt?



Extra challenge: Sorting Fish

Design a game board with different sized targets or 'baskets' in which to place the fish.

Work out additional scores for successfully landing a fish in a basket.

Ask another team to join in the great 'Fishing Game'.

