Learning Series

Acceleration Car



This building-block robotics course introduces sensors and visual programming. Students can construct robots with the provided parts, then program their movements and behavior using a graphical coding environment.

Learning Target

01

Knowledge goal

Familiar with the use of gear ratios, understand the acceleration and deceleration relationship of gears.

02

Ability goal

Understand the simple mechanical model, analyze the structure and use the equipment to complete the corresponding case.

03

Emotional attitudes and values

Understand simple mechanical models, increase mechanical cognition, comparative study, start the analysis process under the guidance of the teacher

Learning Target

01

Learning focus

Know the gear ratio calculation of the gear

02

Learning difficulties

Deceleration/acceleration calculation between gears

Contents

01 **Course Introduction**

02 **Teaching New Knowledge**

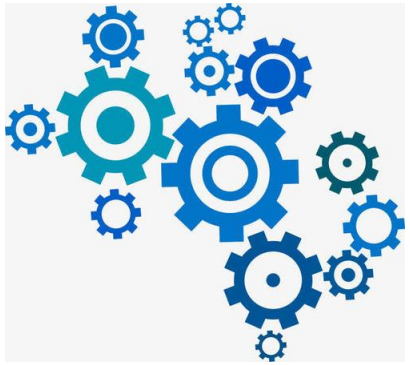
03 **Task Practice**

04 **Test Effect**

Course Introduction



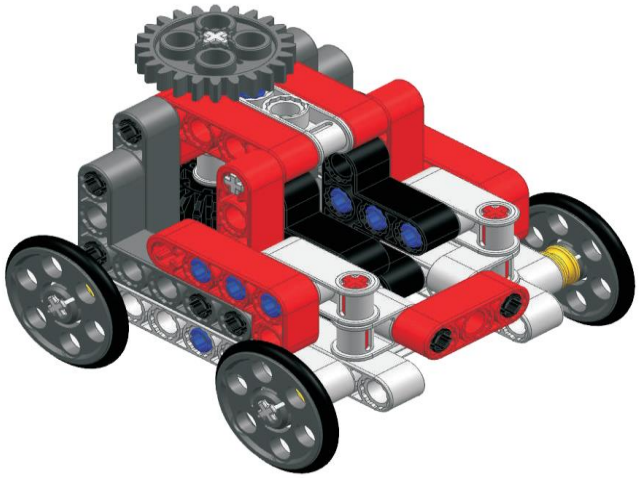
Course Introduction



- What results can you get in the experiment of the last class?
- What happens when the big gear is transmitted to the pinion?
- What about the other way?

Have you discovered that if the gear drive accelerates inside, that is, the drive wheel drives the driven wheel pinion for the large gear , that is, the large wheel drives the small wheel to accelerate the transmission, and the transmission speed is determined by the size ratio.

Course Introduction



Acceleration car

Know about the Acceleration Car

The variable speed trolley is a transmission between the gear and the gear, which continuously converts the kinetic energy and the elastic potential energy, so that the car can shift while walking. The car has been repeated for a second and the speed is still very fast, and the next second is slowed down until the energy consumption is completed.

With this robot, we will recognize the new gear matching method, is it ready?

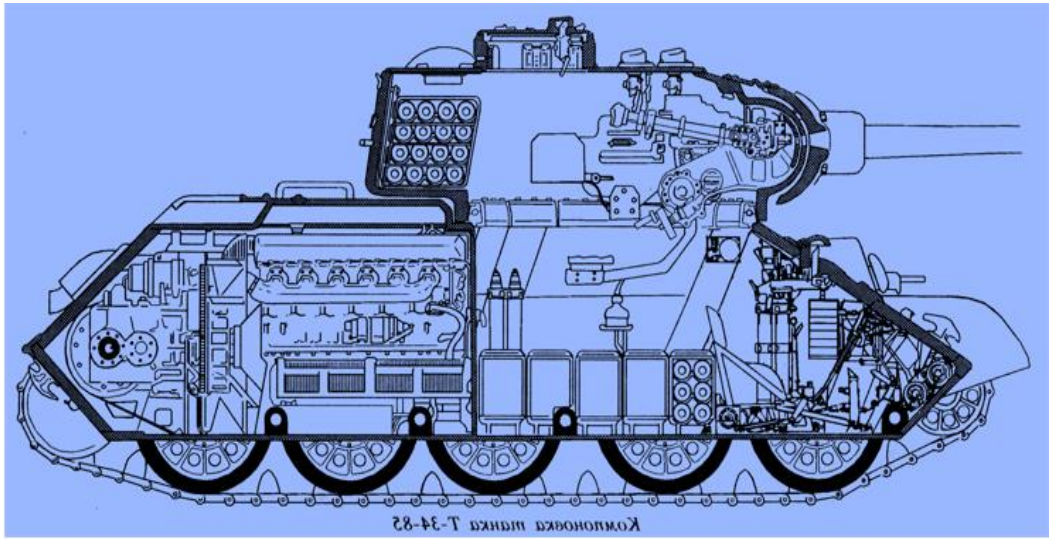
Teaching New Knowledge



Teaching New Knowledge

Driving wheel:
When the engine is driven to rotate, the gears fixed to the input shaft rotate synchronously.

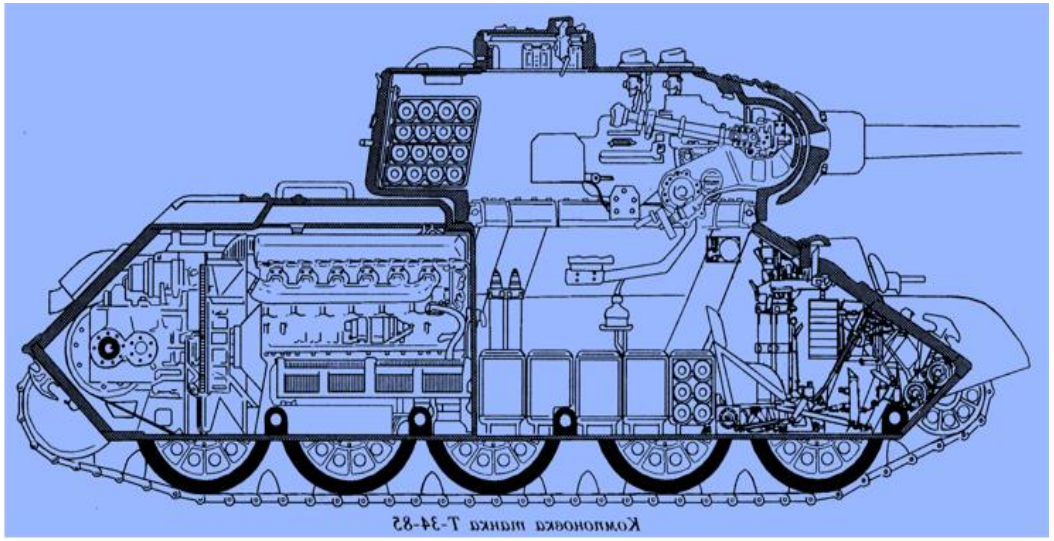
Driven wheel:
The gear that is integrated with the output shaft is forced to rotate, and the gear is called a driven gear.



Teaching New Knowledge

Transmission ratio:
The ratio of the number of teeth of the driven gear to the number of teeth of the driving gear is defined as the gear ratio.

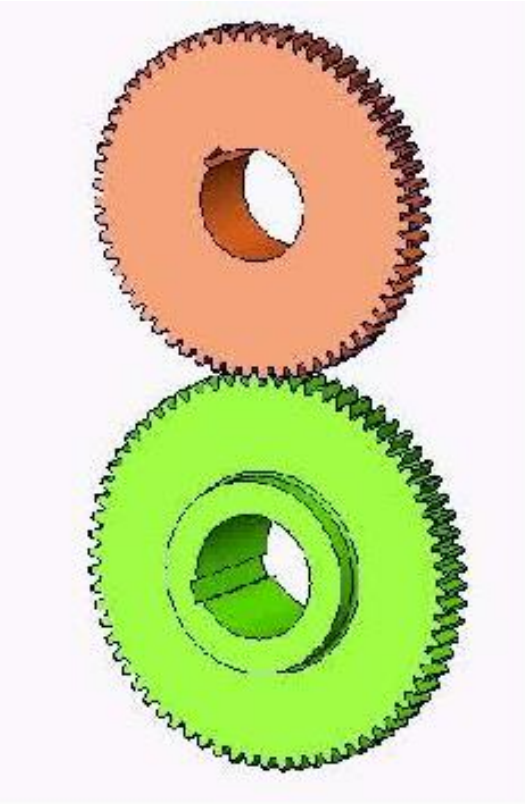
Transmission grade:
The driving gear and the driven gear are the first-stage transmission, and the number of the driven wheels is called the second-level and third-level in order.



Teaching New Knowledge

Transmission ratio = number of driven gears / number of driven gears = drive wheel speed / driven wheel speed
i=z2/z1=n1/n2

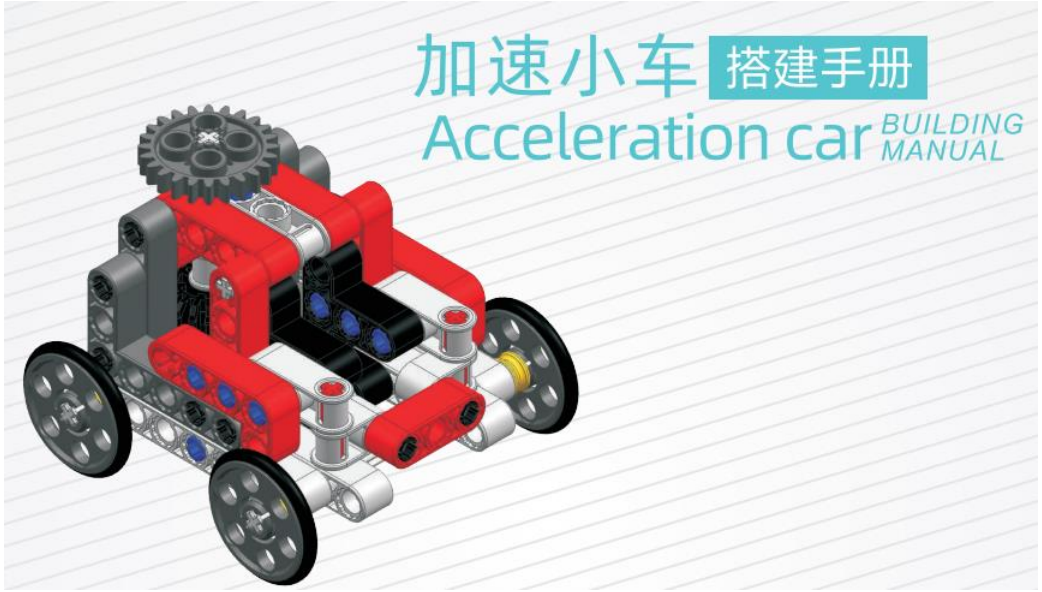
The gear ratio of the deceleration is greater than 1, and the gear ratio of the increased speed is less than one. Find out if the gear is decelerating or the speed ratio will be clear.



Task Practice



Task Practice



Assembly requirements

1. stable structure

2. focus is right

3. shape match

Checking Effect



Test Effect



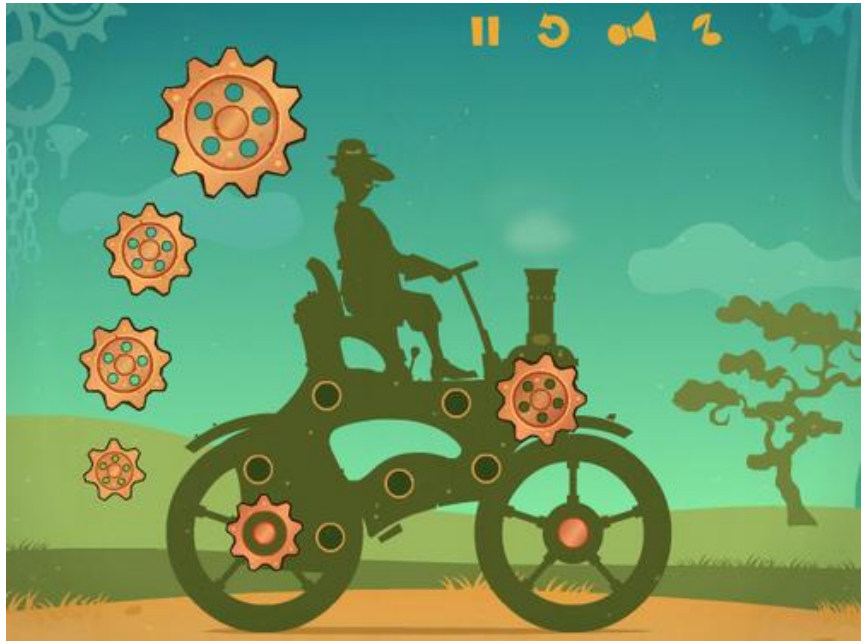
Reviewing the learning content and deepen the impression.

Question 1 What is the name of the robot made today?

Question 2 What structure does the robot use today?

Question 3 What does the speed of today's robots change?

Test Effect



after class homework

Modified gear
1 increase the number of gears in the work, increase / decrease the gear ratio of the gear

Thank you!

BE STEM READY

