

Rues school projects 1-5



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Key Information



Topic: F	Road	Safety	Rules
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Grade: Pre-School – 4th Grade

Group size: 6-10 students

Road safety is an important topic for young students because everyone uses roads, and the dangers associated with the roads impact everyone. Robo Wunderkind robotics kits help children to practice and repeat road safety rules through cooperative play. You can adapt each project to the age group you're working with by changing the complexity of tasks.

Complexity:

Each lesson includes the basic level as well as a possible modification — additional activity. It makes possible to adapt the complexity of the lessons to the personal needs of your students.

Recommended Prior Knowledge:

- Basic understanding of RW Modules: Main Block, RGB Light, DC Motors, Servo Motor, Button, Distance Sensor (Optional).
- Basic understanding of the Robo Live App and Robo Code App.
- Basic knowledge about road safety rules.

Materials Required:

- Robo Wunderkind robotics kit(s);
- Tablet(s);
- Some materials to customize robots and create an environment: Lego[™] bricks, colored paper, cardboard etc.

Projects' Overview

Projects	Арр	Complexity	Pages
Robo Drives Safely	Robo Live App		3
Robo Is a Traffic Light Robo Is a Smart Traffic Light	Robo Code App Robo Code App	☆ ☆ ☆	6
Robo Is a Boom Barrier	Robo Code App	公公	15

Project 1: Robo Drives Safely

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Topic: Road Safety Rules

Grade: Pre-School, 1st - 2nd Grades

Complexity: ★☆☆



Robo's Story:

In a small toy town, the magic residents are living a very safe and organized life. Robo is new in town and is not aware of the town's road safety rules. Can you help Robo learn the rules and drive safely through the toy town?



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Problem Situation:

We need to help Robo learn the road safety rules in order to drive safely.

Solution:

Build the Robo-vehicle and control it, using the Robo Code App to drive through the town, taking the road safety rules into account.

Project 1: Robo Drives Safely



Modules:



Main Block DC Motors





x2

Wheels



Control:



Objectives:

To drive the Robo-vehicle using the Robo Live App and to demostrate safe pedestrian and passenger bahavior.

Learning Outcomes:

- I can build the Robo-vehicle;
- I can control Robo using the Robo Code App;
- I know and can explain the road safety rules;
- I can drive the Robo-vehicle taking the road safety rules into account.

Recommended Prior Knowledge:

- Basic understanding of RW modules: Main Block, DC Motors, Servo Motor (Optional);
- Basic understanding of the Robo Live App;
- Basic knowledge about road safety rules.

Materials Required:

- Robo Wunderkind robotics kit(s);
- Tablet(s);
- Some materials to imitate the roads, traffic, and pedestrians: colored paper, markers, toys, etc.

Time Required: 45-60 Minutes

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Project 1: Robo Drives Safely

Activity Stages:

7 – 10 min Lead-in

Guided Activity - 20 min

51

Tell the **Robo's Story** and together with the students identify the **problem situation**. Then come up with the **theoretical solution**.

• **Discuss:** What are the road safety rules? Why are they important? Which rules do you know?

• Set a goal: Work together to create a toy town, build the Robo-car and control it using the Robo Code App to drive through the town taking the road safety rules into account.



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- Decide which materials you will need to create a toy town;
- Decide which modules you will need for the Robo-car and why.

Create an environment: Use different materials to build the toy town, roads, crossroads, traffic signs.

Build: Create a Robo-car together with the students using RW Modules and some other materials.

Set challenges: Put different signs on the road, such as "Stop," "Do Not Enter," "One Way," "Near a School" signs and etc. Discuss how these signs should impact Robo's driving. Use Robo Code App to drive Robo-car through the town, taking the road safety rules into account

Independent 15 – 20 min **Activity**

Practice: Let students imitate the traffic and drive their Robo-car through the town, taking the road safety rules into account. Students can work independently or cooperate to make the common project with two or more robots.



Sum up: Discuss the problem situation, its solution(s) and their pros & cons, road safety rules and signs. Receive feedback: any difficult moments during the building process or while solving the problem. Clean Up.



Project 2: Robo Is a Traffic Light

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Complexity: ★☆☆

Topic: Road Safety Rules

Grade: Pre-School, 1st Grade



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Robo's Story:

The toy town is growing and it needs its first crossroads! However, there are a few problems... The toy residents do not know how to cross the roads safely, and cars aren't aware of the road safety rules, either.Together with Robo, can we help the residents of the magic toy town find a way to organize the traffic?

Problem Situation:

We need to regulate the traffic in the toy town.

Solution:

Build and program the traffic light using the Robo Wunderkind robotics kit in order to regulate a traffic in the toy town.

Project 2: Robo Is a Traffic Light



Modules:



Main Block RGB LED







Connector Block

Connectors

Program:





Blink

Wheel

Visuals

Constant Light

Objectives:

To build and program the Robo-traffic light in order to control the traffic.

Learning Outcomes:

- I can build the Robo-traffic light;
- I can create a simple program for the Robo-traffic light using the Robo Code App;
- I know and can explain the meaning of each color of the traffic light.

Recommended Prior Knowledge:

- Basic understanding of RW modules: Main Block, RGB Light;
- Basic understanding of Robo Code App and its coding logic;
- Basic knowledge about a traffic light and its function.

Materials Required:

- Robo Wunderkind robotics kit(s);
- Tablet(s);
- Optional: toy cars and people to imitate traffic and pedestrians.

Time Required: 45-60 Minutes



Project 2: Robo Is a Traffic Light

Activity Stages:

Tell the Robo's Story and together with the students identify the problem situation. Then come up with the theoretical solution.

- Discuss: What helps to control the movement of traffic? What is the traffic light, and how does it function? Which colors does it show and what is the meaning of each color? How does a traffic light help cars and pedestrians? Why are traffic lights important?
- Set a goal: Let's build and program the Robo-traffic light to help residents of toy town regulate the traffic.



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- Decide on modules and materials you will need for a project;
- Make a step-by-step plan for building and programming.
- Build and Program: Re-build and reprogram a few times if necessary you need to find a solution.
- Ask: How long does it usually take for you to cross the road? Give some challenges to solve:
- Program the Robo-traffic light to show red / yellow / green light for a certain amount of seconds;
- Program the Robo-traffic light for special situations (wait longer time for the green light for cars / pedestrians, etc.)
- Show and Share: Present your ideas to the class. Discuss different solutions and give the students constructive feedback. 5

Independent 15 – 20 min **Activity**

Practice: Let students imitate the traffic situation in toy town and use Robo-trafic light to control it. Students can work independently or cooperate to make the common project with two or more robots.



Sum up: Discuss the problem situation, its solution(s) and their pros & cons, road safety rules and signs. Receive feedback: any difficult moments during the building process or while solving the problem. Clean Up.

3 **Create an environment:** Use different materials and toys to imitate the traffic situation in the toy town.



Guided Activity

7 - 10 min Lead-in



Project 3: Robo Is a Smart Traffic Light



Topic: Road Safety Rules

Grade: 2nd - 3nd Grade

Complexity: ★★☆



Robo's Story:

There are different situations on the road; at one time, there are many cars, while at another there are many pedestrians who want to cross the road. Is it enough to have just one program to regulate the traffic in different times and situations? Can we program our Robo to be a smart traffic light?

Problem Situation:

We need to regulate the traffic in different situations.

Solution:

To build and program the Robo-Smart Traffic Light using the Robo Wunderkind robotics kit to control the traffic in different situations.

Project 3: Robo Is a Smart Traffic Light



Modules:



Main Block





RGBIFD

Button

Connector Block Wheel Connectors

Program:





Conditions

Button

Objectives:

To build and program the Robo-Smart Traffic Light to regulate the traffic in several different road situations.

Learning Outcomes:

- I can build the Robo-Smart Traffic Light;
- I can create a simple program for the Robo-Smart Traffic Light using the Robo Code App: Visuals, Sounds, Conditions;
- I know the meaning of each color of the traffic light; I can use this knowledge for different road situations;
- I know what smart devices are and their functions.

Recommended Prior Knowledge:

- Basic understanding of RW modules: Main Block, RGB Light, Button;
- Basic understanding of Robo Code App and its coding logic;
- Basic knowledge about a traffic light and its function;
- An understanding of sensors (particularly the button sensors) and how they might be used in the real world.

Materials Required:

- Robo Wunderkind robotics kit(s);
- Tablet(s);
- Optional: toy cars and people to imitate traffic and pedestrians.

Time Required: 45-60 Minutes

Project 3: Robo Is a Smart Traffic Light

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Activity Stages:

Lead-in 7 – 10 min

- Tell the Robo's Story and together with the students identify the problem situation. Then come up with the theoretical solution.
- **Discuss:** Is the traffic situation the same during different times of the day? How does it change? Is one program enough for the traffic light to properly regulate traffic during different times and situations? Can the same traffic light use different modes? Do you know what the smart devices are? Why do people create and use the smart devices?
- Set a goal: Build and program the Robo-Smart Traffic Light to control traffic in different times and situations!



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- Decide on modules and materials you will need for a project;
- Make a step-by-step plan for building and programming.



- Build and Program: Re-build and re-program a few times in your search to find a solution. Give some challenges to solve:
- Program the Robo-Smart Traffic Light to change the mode because of the certain time of the day (night / daytime);
- Program the Robo-Smart Traffic Light to change the mode because pedestrian(s) pushed a special button;
- Find the optimal time for the pedestrians to cross the road.
- Show and Share: Present your ideas to the class. Discuss different solutions and give the students constructive feedback.



Reflexion & Feedback **Practice:** Let students imitate the traffic situation in toy town and use Robo-smart traffic light to control it. Students can work independently or cooperate to make the common project with two or more robots.



Sum up: Discuss the problem situation, its solution(s) and their pros & cons, road safety rules and signs. **Receive feedback:** any difficult moments during the building process or while solving the problem. **Clean Up.**

Guided Activity 15 - 20 min

Project 4: Robo Is a School Guard

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Topic: Road Safety Rules

Grade: 1st - 4th Grade





Robo's Story:

There is a small school in the toy town; to get to the school, pupils need to cross the road. Usually, there is a school guard to help them cross the road safely. Today the guard is a bit sick and can't go to work! Can we work with Robo to help children to cross the road safely?

Problem Situation:

We need to help children cross the road safely.

Solution:

Build and program the Robo-School Guard using the Robo Wunderkind robotics kit.

Project 4: Robo Is a School Guard



Modules:

Main Block RGB LED Button DC Motor





Connector

Wheels Connectors

Block

Program:





Visuals



Movement





- Constant Light

Blink

Motor



Button

x3

Materials Required:

- Robo Wunderkind robotics kit(s);
- Tablet(s);
- Optional: toy cars and people to imitate traffic and pedestrians.

Time Required: 45-60 Minutes

Conditions



Objectives:

To build and program the Robo-School Guard.

Learning Outcomes:

- I can build the Robo-School Guard;
- I can create a simple program for the Robo-School Guard using the Robo Code App: Visuals, Sounds, Conditions (optional);
- I know and can explain the road safety rules: pedestrian crossing, zebra crossings, "Near a School" signs, etc.

Recommended Prior Knowledge:

- Basic understanding of RW modules: Main Block, RGB Light, Button, Distance Sensor;
- Basic understanding of Robo Code App and its coding logic; •
- Basic knowledge about road safety rules: pedestrian crossing, zebra crossings, "Near a School" signs, etc.;
- An understanding of sensors (particularly the button & distance sensors) and how they might be used in the real world.

Project 4: Robo Is a School Guard

Activity Stages:



- **Tell** the **Robo's Story** and together with the students identify the **problem situation**. Then come up with the **theoretical solution**.
- **Discuss:** Do you need to cross the road to get to the school? If yes, how do you do it? Which rules do you know about crossing the road? Do you know the "Near a School" sign? What does the sign tell the pedestrians & cars? What can be done to help children to cross the road near the school?
- Set a goal: Build and program the Robo-School Guard to help children cross the road safely.



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- Decide on modules and materials you will need for a project;
- Make a step-by-step plan for building and programming.
- Create an environment: Use different materials and toys to imitate the traffic situation in the toy town.
- Build and Program: Re-build and re-program a few times in your search to find a solution. Give some challenges to solve:
- The Robo-school guard lets children cross the road once during the certain time;
- The Robo-school guard lets children cross the road if they pushed the button;
- The Robo-school guard lets children cross the road if it identifies that a child is waiting (Distance sensor);
- Show and Share: Present your ideas to the class. Discuss different solutions and give the students constructive feedback.



Practice: Let students imitate different situations in toy town when they need to use the Robo-School Guard. Students can work independently or cooperate to make the common project with two or more robots.



Sum up: Discuss the problem situation, its solution(s) and their pros & cons, road safety rules and signs. **Receive feedback:** any difficult moments during the building process or while solving the problem. **Clean Up.**

Guided Activity 15 – 20 min robo

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Project 5: Robo Is a Boom Barrier

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wunderkind

Topic: Road Safety Rules

Grade: 1st - 4th Grade

Complexity: ★★☆



Robo's Story:

There is a train station in the toy town; the train comes 4 times per day, always at a certain time. However, sometimes it can come a bit earlier or have a delay. To get to the train station, toys have to cross the railroad. Is it safe for them? Why? Can we work with Robo to help them cross the railroad tracks safely?

Problem Situation:

We need to help toys cross the railroad safely.

Solution:

Build and program the Robo-Boom Barrier using the Robo Wunderkind robotics kit to design a way to indicate that train is coming.

Project 5: Robo Is a Boom Barrier



Modules:







Main Block







Servo

Connector Block

Wheels Connectors

RGB LED

x3

Program:





Servo

Movement



Objectives:

To build and program the Robo-boom barrier.

Learning Outcomes:

- I can build the the Robo-boom barrier:
- I can create a simple program for the Robo-boom barrier using Robo Code App: Visuals, Sounds, Motion, Conditions:
- I know and can explain some road safety rules, the boom barrier function.

Recommended Prior Knowledge:

- Basic understanding of RW modules: Main Block, RGB Light, Servo Motor;
- Basic understanding of Robo Code App and its coding logic;
- Basic knowledge about some road safety rules: the boom barrier function, railway crossing;
- An understanding of conditions (particularly Timer and Clock conditions) and how they might be used in the real world.

Materials Required:

- Robo Wunderkind robotics kit(s);
- Tablet(s);
- Optional: toy cars and people to imitate traffic and pedestrians.

Time Required: 45-60 Minutes

Project 5: Robo Is a Boom Barrier

Activity Stages:

7 – 10 min Lead-in

Guided Activity - 20 min

15

- Tell the Robo's Story and together with the students identify the problem situation. Then come up with the theoretical solution.
- **Discuss:** Have you ever crossed the railroad? How was it? Have you ever seen a railroad crossing? Do you know the rules of how to cross the railroad? Do you know what the boom barrier is? How does it function?
- Set a goal: Build and program the Robo-Boom Barrier to help inhabitants of the toy town cross the railroad safely.



- Decide on modules and materials you will need for a project;
- Make a step-by-step plan for building and programming.
- Build and Program: Re-build and re-program a few times in your search to find a solution. Give some challenges to solve:
- The Robo-Boom Barrier closes the railroad crossing for a certain time;
- The Robo-Boom Barrier closes the railroad crossing if the railway station worker pushes the button;
- The Robo-Boom Barrier closes the railroad crossing if it identifies that the train is coming (Distance Sensor).

Show and Share: Present your ideas to the class. Discuss different solutions and give the students constructive feedback. 5

Independent 15 – 20 min **Activity**

Reflexion &

Practice: Let students imitate different situations in toy town when they need to use the Robo-Boom Barrier. Students can work independently or cooperate to make the common project with two or more robots.



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Sum up: Discuss the problem situation, its solution(s) and their pros & cons, road safety rules and signs. Receive feedback: any difficult moments during the building process or while solving the problem. Clean Up.

Create an environment: Use different materials and toys to imitate the traffic situation in the toy town.

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