

# THE PAUL STREET BOYS THE GRUND (T3)

S3  
T3  
D4  
L1 P3

## Focus on:

- Attention (D4)



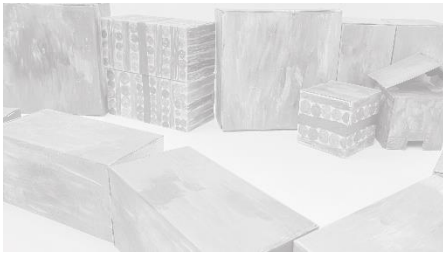
### Task6: Plan and build a cool playground or build the „Grund“!

Students create elements of a playground or of the „Grund“.

#### Every solution is good!

Any kind of tool and material can be used!

You can use the ideas and the list of materials from the Idea Bazaar, use your own ideas or just let the children to solve the problem using their creativity.



#### Idea Bazaar – some ideas:

- Building a playground or the Grund out of ArTeC Blocks
- Building a playground or the Grund out of recycled materials
- Creating 3D computer graphics

**For details of the different solutions, see the Idea sheets!**

#### Developmental fields:

##### In focus:

- Fine motor skills
- Creativity
- Spatial orientation

#### In addition:

- Attention concentration
- Subject concentration – Drawing, arts&crafts, IT
- Talent development

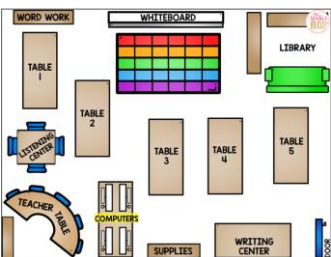
### Task3: Draw a map of the classroom or the schoolyard! Make challenges to each other: get from one point to another!

Students create maps – making sure to measure the proportions and distances of objects

#### Every solution is good!

Any kind of tool and material can be used!

You can use the ideas and the list of materials from the Idea Bazaar, use your own ideas or just let the children to solve the problem using their creativity.



#### Idea Bazaar – some ideas:

- Students can make challenge cards (e.g. Get from the whiteboard to the teacher's table!) and play with them
- Students should give instructions to each other (Go ahead, Turn right, etc.)
- First move in the classroom for real, then just show the route you'd take on the map!

**For details of the different solutions, see the Idea sheets!**

#### Developmental fields:

##### In focus:

- Spatial orientation
- Computational thinking
- Attention

##### In addition:

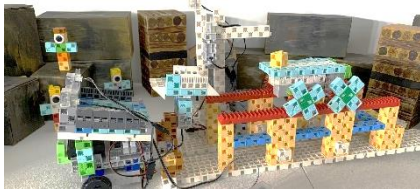
- Subject concentration – Drawing, IT, mathematics
- Creativity

#### How to manage output:

Hang the pictures on the wall, on a big poster, and ask the children to arrange them according to a rule they decide. Store the objects in a wardrobe, to protect them from falls. Attach a label with the name of the group!

# THE PAUL STREET BOYS THE GRUND (T3)

S3  
T3  
D4  
L2 P3



## Focus on:

- Attention (D4)

## Goals of the lesson:

- text comprehension
- problem solving
- decision making
- organizing group work



The grund was a vacant lot on the corner of Paul Street and Maria Street. For the Paul Street Boys, who lived on narrow streets among rows of tall houses, this little lot spelled freedom and boundlessness. Its fence ran along the Paul Street side. Two tall buildings bordered it left and right, and in the rear... yes, it was the rear section which rendered this grund most attractive, magnificent. Here, it should be noted, it was adjoined by another spacious site. This was under lease to a saw mill concern, and the lot was thickly strewn with piles of lumber. Here stacks of firewood formed symmetrical blocks, and among these huge blocks ran little alleys. It was a veritable labyrinth. Some three-score narrow little streets intersecting each other among mute and dark stacks of wood. It was no easy matter to find your way in this maze. But he who did manage to struggle through found himself within a small clearing in the middle of which stood a tiny hut. Within it was housed the steam-saw. It was a strange, eerie little house. It was completely covered by wild grapevines. Its graceful black chimney puffed through green foliage; at regular intervals and with clock-like regularity its clear white vapours issued forth. All about the hut stood big, clumsy vans. From time to time one of these vans would back toward the eaves, producing a creaking sound. Directly under the eaves was a small window and out of this window extended a wooden trough. As the van stopped near the window, out of the trough there suddenly began to dribble a mass of kindling wood; it fairly poured into the big van. And as the van was filled to the top, the driver gave a shout. Thereupon the little chimney ceased its puffing, within the hut immediate silence ensued and, at the bidding of their master, the horses started off with their load. Another van - hungry and empty - rolled up to the little window and the black iron chimney resumed its vomiting, the dribbling of kindling wood was heard again.

### Main features and interactions of the characters

Character	Features	Interactions
The sawmill	Puffs - issues smoke Extends a trough Cuts wood	Pieces of wood are poured into the van When the driver of the van gives a signal, the sawmill stops
The van	Rolls The driver shouts	Rolls up to the sawmill Leaves when it is full

### How to use the character card:

Each student fills in his/her own Character card:

- writes the name of the character
- their features, movements, reactions, etc.
- collects the elements of the environment, other accessories, things to be built
- thinks over the phases, tools and materials of the robot's building

Students can use more pieces of each part of the Character card if needed!

Sawmill  
Van

Puff  
Extend the trough  
Pour pieces of wood  
Roll to the sawmill  
Give signal  
Leave the sawmill

The Grund  
Stacks of wood - maze  
Grapevine covering the walls of the sawmill  
Pieces of wood

The main actions of the story  
Divide the text segment into pieces  
Make a list about things needed  
Media files needed

### Suggestions The Grund


- Discuss the importance of the Grund to the boys
- Collect and depict the the sights and buildings of the Grund
- Build a model of the Grund

### The sawmill

- Discuss the usage of kindling wood
- Discuss the different types of heating and fuel - focusing on historical eras, geographical and social differences, environmental protection
- Understand how the sawmill works - have the students draw plans, flowcharts


### Suggested materials

- ArTeC robot and Blocks (at least the 112 pcs set)
- Cardboard, boxes, recycled materials, other building sets




Your name \_\_\_\_\_

Build \_\_\_\_\_




Your name \_\_\_\_\_

Be attentive, your robot should be able to: \_\_\_\_\_



Your name \_\_\_\_\_

There also should be: \_\_\_\_\_



Your name \_\_\_\_\_

Think over: \_\_\_\_\_

# THE PAUL STREET BOYS THE GRUND (T3)

S3  
T3  
D4  
L3-4  
P4



## Suggested materials

- ArTeC Blocks (at least the 112 pcs set) and ArTeC robotics set (1 or 2 Studuino motherboards, 3 DC motors, wheels, small gears, 2 servo motors, 4 Touch sensors, 1 IR Photoreflector, 1 Sound sensor, 1 Accelerometer, 4 LEDs)
- Photos, videos about sawmills
- Flowchart of a sawmill's operation
- Mindmap or Chart draft, Storyline
- Character cards and Robotic task card template
- Pencil

## How to fill in the Robotic card?

- Choose robot's „activity” and its programming complexity according to the Character task card, the developmental aim and the programming level that fits the child's skills.
- More Robotic cards can be filled in if needed (for clarification or for differentiation).

## Focus on:

- Attention (D4)

## Goals of the lesson:

- fine motor skills,
- problem solving,
- decision making,
- life skills

## Suggestions

### Sawmill

- Understand how the sawmill works – have the students draw plans, flowcharts
- Build a simple modell of the sawmill with movable parts from ArTeC Blocks

### Van

- Collect possibilities for moving and directing the van
- Collect possibilities for detecting that the van arrived to the sawmill and that the van is full and can leave

Trough  
Ramp  
Pieces of wood  
Tossing arm  
Wheels



### Robotic task card

Your name \_\_\_\_\_

Build a robot that can move it's \_\_\_\_\_

Use actuators and sensors for building:  
 \*Senses\* are green  
 \*Actions\* are blue  
 Choose the needed parts!  
 (Check the boxes)

Block	Sensor	DC motor	Sound sensor	Light sensor
Accelerometer	Infrared sensor	Touch sensor	Electronic buzzer	LED

Build and program so that the robot \_\_\_\_\_

Use the Technical corner for robotic building materials!

## Related topics in the Technical corner

- Programming DC motor
  - Winding the motor a number of times (2.a, 2.b)
  - Winding the motor until the sensor detects change (4.b, 4.c)
- Programming servo motor
  - Moving the arm to a given angle (3.a)
- Testing and programming Touch sensor (4.a, 4.b, 4.c)
  - Remote control for the robot made of 4 Touch sensors(4.d)
- Testing and programming IR Photoreflector (7.a, 7.c, 7.e)
  - Using an IR Photoreflector for detecting an object (7.d, 7.e)
- Testing and programming Sound sensor (9.a)
  - Activating the robot with sound (9.b)
- Using LED (5.a)
  - Blinking (5.b)
- Robot controller made of Accelerometer (4.e)

Sawmill with mechanical tossing mechanism

Van rolls up to the sawmill automatically

PROG1

The trough and the tossing arm moves automatically

Van rolls up to the sawmill automatically

PROG2

The trough, the tossing arm and the ramp move automatically. The sawmill begins to work when the driver of the van shouts  
Van controlled by a remote controller

PROG3

The trough, the tossing arm and the ramp move automatically. The sawmill begins to work when the van stops under the ramp  
Van controlled by a remote controller

PROG4

# THE PAUL STREET BOYS THE GRUND (T3)

S3  
T3  
D4  
L3-4  
P5

## Ideas for robots on different programming levels

Sawmill with mechanical tossing mechanism

Van rolls up to the sawmill automatically

PROG1

The trough and the tossing arm moves automatically

Van rolls up to the sawmill automatically

PROG2

The trough, the tossing arm and the ramp move automatically. The sawmill begins to work when the driver of the van shouts  
Van controlled by a remote controller

PROG3

The trough, the tossing arm and the ramp move automatically. The sawmill begins to work when the van stops under the ramp  
Van controlled by a remote controller

PROG4



## Sawmill

### P1 Build a mechanical sawmill

- It can be achieved by movable parts without robotics
- The trough can be built as a simple cart with gears for wheels, rolling on drive rails
- The tossing arm that forwards the pieces of wood to the van using a ramp can tilt on axles

### P2 Build an automatic sawmill

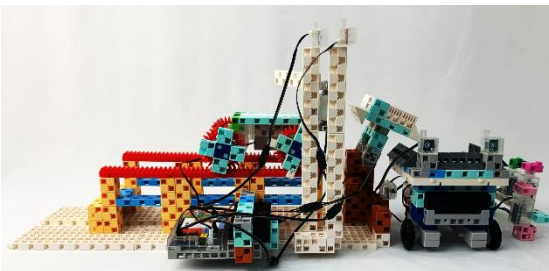
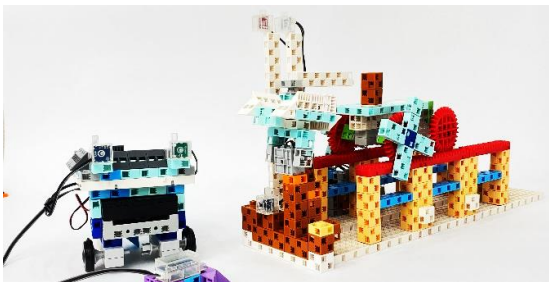
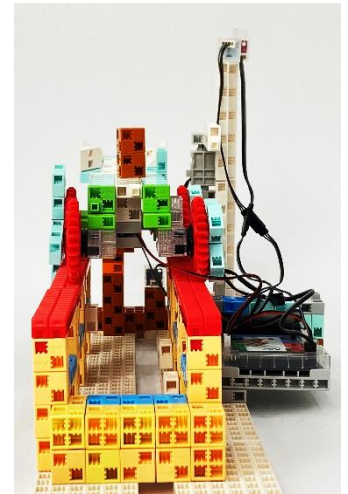
- The trough can be built as a simple cart with gears for wheels, rolling on drive rails (1 DC motor)
- The tossing arm that forwards the pieces of wood to the van using a ramp should be moved by a servo motor
- An LED should sign the action with blinking
- The ramp can tilt on axles

### P3 Build a sound-controlled sawmill

- The working process of the sawmill should start when a Sound sensor detects sound (the shouting of the van's driver)
- The trough and the tossing arm should be built as in P2
- The ramp is tilted by a servo motor while an LED is blinking

### P4 Build a cooperative sawmill

- The working process of the sawmill should start when an IR Photoreflexor detects the van standing under the ramp
- The whole process is the same as in P3



## Van

### P1 Build an automatic van

- The van can roll up to the sawmill on 2 DC motors
- After turning it on, the wheels rotate a number of times

### P2 Build an automatic van

- The van can roll up to the sawmill on 2 DC motors
- After turning it on, the wheels rotate a number of times

### P3 Build a directable van

- Build a van with 2 DC motors
- Add a 4-Touch sensor remote control to it
- Blinking LEDs should show the direction it is turning

### P4 Accelerometer-controlled van

- Build a van with 2 DC motors
- Add an Accelerometer as a remote control to it
- Blinking LEDs should show the direction it is turning