

# THE PAUL STREET BOYS HECTOR GIVES A SIGNAL (T4)

S3  
T4  
D8  
L1 P3

## Focus on:

- Other subjects – natural sciences (D8)



**Task3: Draw a map of the classroom or the Grund! 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!**

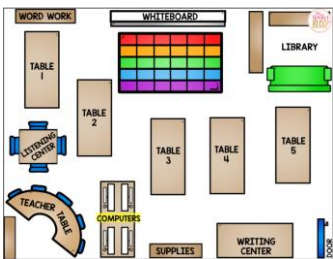
Any kind of tool and material can be used!

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
- Creativity

**Task1: Imagine yourself founding a gang! What does it mean? What is important for a gang? How would you pick the participants?**

**Plan its mode of operation, roles and symbols!**

Students discuss what makes a gang a gang.

**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:

- Collecting the features of a gang
- Writing its by-laws
- Planning the roles in the organisation
- Creating a potato or rubber stamp
- Creating its flag and seal

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

## Developmental fields:

### In focus:

- Social competencies
- Fine motor skills
- Creativity

### In addition:

- Life skills
- Subject concentration – Citizenship
- Talent development

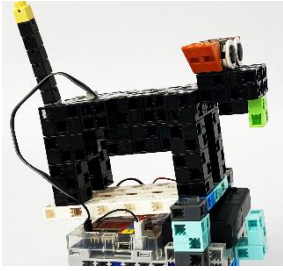


## How to manage output:

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 HECTOR GIVES A SIGNAL (T4)

S3  
T4  
D8  
L2 P3



## Focus on:

- Other subjects – natural sciences (D8)

## Goals of the lesson:

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



At half past two that afternoon there was not yet a soul on the grund. Shortly after half past two, the Paul Street gate creaked on its hinges, admitting Nemeček. Out of his pocket he drew a large slice of bread, gazed about and, after convincing himself that there was no one present, fell to munching the crust of his bread. For a while he continued to nibble at his bread then, feeling somewhat bored, went roaming among the woodpiles. Meandering about in this fashion, he suddenly came upon the watchman's dog. „Here, Hector!“ he called; but Hector manifested no inclination to return this amiable greeting. All that he deigned was a fleeting wag of the tail. With that he sprinted away, barking viciously. Nemeček dashed after him. Hector stopped at one of the wood stacks and continued to bark vehemently. The stack was one of those on which were perched the boys' fortresses. On top of this stack was a citadel built of logs; on it was a slender stick, from the tip of which fluttered a tiny red-green bunting. Hector leapt about the fortress and barked incessantly. „What's the trouble?“ said the sandy lad to the dog, for there was a great friendship between them – perhaps because Hector was the only other private in their army. Nemeček peered at the fortress above. He saw no one, but felt certain that someone was stumbling about up there. And so he began to clamber up, his legs braced against protruding logs. He was about midway when he clearly heard someone shifting pieces of wood directly overhead. His heart began to thump and suddenly he felt an urge to turn back. But looking down, he saw Hector below, and that gave him fresh courage. „Don't be afraid, Nemeček!“ he said to himself and continued cautiously to climb upward. At every landing he thought it necessary to encourage himself. Over and over again he said: „Don't be scared Nemeček“. And he reached the top of the woodpile. There he murmured a final „Don't be afraid, Nemeček“. He was about to step across the narrow fortress wall, but the foot he raised suddenly remained suspended in the air. So frightened was he that he merely exclaimed: „Jesus!“ Pell-mell he clambered back down along the parapets. Upon reaching the ground, his heart palpitated furiously. He looked up to the fortress. There he saw, standing beside the flag, his right foot resting on a rampart, Feri Áts – terrible Feri Áts – arch-foe of the Paul Street Boys and leader of their rival gang. His scarlet, baggy blouse fluttered in the wind. There was a smirk on his face. Nemeček really was afraid, so much so that he ran away. By the time Nemeček ventured to look back, Feri Áts' crimson blouse was no longer in sight. Moreover, the banner atop the fortress had likewise vanished!

## Main features and interactions of the characters

Character	Features	Interactions
Hector	Runs, barks Wags his tail Stops at a certain stack	Wags his tail to Nemeček Barks at the „enemy“
Nemeček	Follows Hector Climbs up the stack	Greets Hector Scared

## 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!

Hector  
Nemeček

Run  
Bark  
Wag his tail  
Run  
Follow Hector  
Climb up the stack

The Grund  
Stacks of wood – maze  
Flag of the Paul Street Boys gang  
Feri Áts

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
- Build a model of the Grund

### Hector

- Have the students collect information about the topic of „dog is man's best friend“. They can represent their thoughts and collected information on a poster, mindmap, ppt, video, etc. Topics can cover responsible animal keeping, protecting animals, dogs' roles and jobs in our life, dogs' communication, behaviour, learning, etc.

## Suggested materials


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



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

Build \_\_\_\_\_


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

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


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

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

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

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

# THE PAUL STREET BOYS HECTOR GIVES A SIGNAL (T4)

S3  
T4  
D8  
L3-4  
P4



## Suggested materials

- ArTeC Blocks (at least the 112 pcs set) and ArTeC robotics set (1 or 2 Studuino motherboards, 2 or 4 DC motors, wheels, 1 servo motor, 5 Touch sensors, 1 or 5 IR Photoreflectors)
- Mindmap or Chart draft , Storyline
- Character cards and Robotic task card template
- Pencil

## Focus on:

- Other subjects – natural sciences (D8)

## Goals of the lesson:

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

## 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).

## Suggestions

Collect ideas about how the Nemecek robot could follow the Hector robot and stop when Hector stops  
Collect ideas about how Hector could move in the maze or along a given route

Collect ideas about how a robot could remember more instructions to be fulfilled later

## 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
  - Repeated movement of the arm for a number of times (3.b)
- Testing and programming Touch sensor (4.a, 4.b, 4.c)
  - Remote control made of 4 Touch sensors (4.d)
- Testing and programming IR Photoreflector (7.a)
  - Using an IR Photoreflector for detecting an object (7.e)
  - Following a line with IR Photoreflector (7.g)
  - Moving in a labyrinth with 2 IR Photoreflectors (7.h)
- Using LED (5.a)
  - Blinking (5.b)
- Using variables (11.)
  - Conditional branch according the value of the variable (11.b)
  - Counting (11.c)
  - Using lists (11.d)
- Using functions (12.)

Legs  
Tail  
Mouth  
Arms

**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)

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

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

Use the Technical corner for robotic helping materials!

Hector and Nemecek on a floorbot-like robot. Using the prewritten program, the robot's route can be programmed by the children

PROG1

Hector and Nemecek on a robot car that moves on a programmed route

PROG2

Hector moves on a robot controlled by the students. Wags its tail at the end of its route

Hector moves on a line-following robot. Wags its tail at the end of its route

PROG3

Hector moves autonomously in the labyrinth of wood stacks, until it gets out. Nemecek follows Hector, stops when Hector stops.

Writing the program for the version in P1

PROG4

# THE PAUL STREET BOYS HECTOR GIVES A SIGNAL (T4)

S3  
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D8  
L3-4  
P5

## Ideas for robots on different programming levels

Hector and Nemecek on a floorbot-like robot. Using the prewritten program, the robot's route can be programmed by the children

PROG1

Hector and Nemecek on a robot car that moves on a programmed route

PROG2

Hector moves on a robot controlled by the students. Wags its tail at the end of its route  
Hector moves on a line-following robot. Wags its tail at the end of its route

PROG3

Hector moves autonomously in the maze of wood stacks, until it gets out. Nemecek follows Hector, stops when Hector stops.

Writing the program for the version in P1

PROG4



## Hector and Nemecek

### P1 Program Hector and Nemecek to go to a certain wood stack

- Build a robot with a small figure of a boy and a small dog on top of it
- Add 4 Touch Sensors to it (for going a given distance forward, backward, turning 90° left, right)
- Write and transfer the sample program to it
- Students can program the robot's movement by pressing the touch sensors one after the other (like with Beebot)

### P2 Build Hector and Nemecek moving on a programmed route

- Build a robot with a small figure of a boy and a small dog on top of it
- Students should program it to move along a planned route (not line-following)

### P3 Build Hector as a controlled robot

Build a robot dog – Hector

- It can be controlled with a 4 Touch sensor controller (functions can be used)
  - A 5th Touch sensor serves for switching on the tail wagging
- OR
- It should move with line following using 1 IR Photorelector
  - It should stop and wag its tail when a Touch sensor is pressed

### P4 Build cooperative or programmable robots

- Build 2 robots: Hector and Nemecek on rolling robots
- Build the maze of the Grund
- Program Hector to be able to navigate in the maze, not coming up against the walls. For this, 2 IR Photoreflectors joined to the left and right sides of the robot can be used
- Hector should stop and wag his tail on a servo motor when he gets out of the maze.
- The end of the maze can be signaled with a black line that can be detected by a 3rd IR Photorelector pointed downwards

OR

- Students build the robot and write the program described in P1
- The program's function: the route the robot should follow can be entered by sequentially pressing the forward, backward, right and left buttons
- The robot remembers the sequence, and traverses the entered route at the press of an additional Touch sensor (using list, variables, functions)

