



# TanglIn

**Tangible Programming & Inclusion**

## TanglIn Toolbox Patchwork

8-12 years old

Paving

Itineraries

Rotation

Scales

Probotic



[www.tangin.eu](http://www.tangin.eu)



/tanginproject



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## Summary

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Fitting shapes in a puzzle.

Expected duration: **45 min** (the lesson plan duration is flexible, and teachers can adapt them accordingly to their needs and class duration).

## Learning Outcomes

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At the end of the session, students are expected to:

- Pave the surface;
- Visualize rotation of pieces;
- Calculate surface areas;
- Program the robot adequately;
- Value STEM areas;
- Develop transversal competencies such as problem-solving, communication and reasoning;
- Develop group work skills, namely, to respect and favor the inclusion of all elements, regardless of gender, culture, etc.

## Links With Curriculum Topics

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Covered Curriculum Topics		
	Subject	Topics
<b>Engineering</b>	<b>Mathematics</b>	Numbers and operations <ul style="list-style-type: none"> <li>• Scale</li> </ul> Geometry <ul style="list-style-type: none"> <li>• Location and orientation – itineraries</li> <li>• Paving</li> <li>• Rotation</li> </ul>
	<b>Technology</b>	Programming <ul style="list-style-type: none"> <li>• Concepts of programming</li> <li>• Programs – Results, errors, and troubleshooting</li> </ul> Robotics <ul style="list-style-type: none"> <li>• Programming objects to solve challenges</li> </ul>

## Notes for Teachers

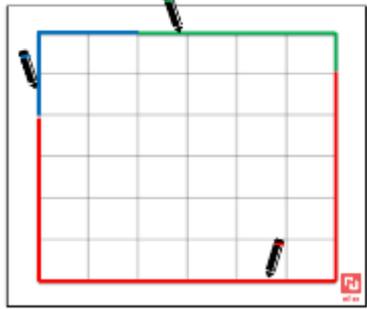
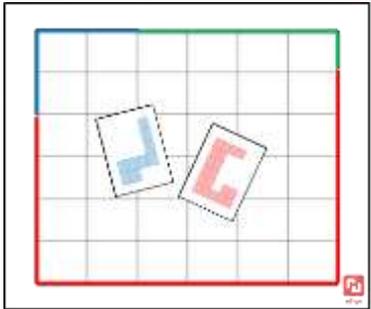
The teacher should prepare, in advance, all the materials needed and the classroom according to the activities to be developed.

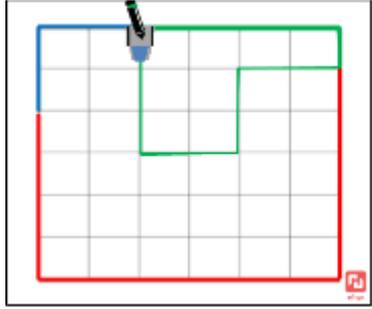
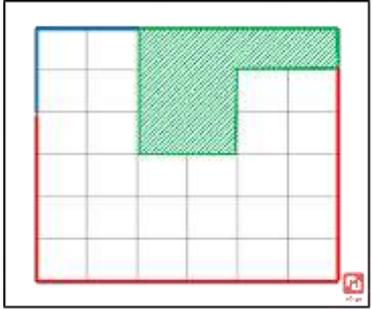
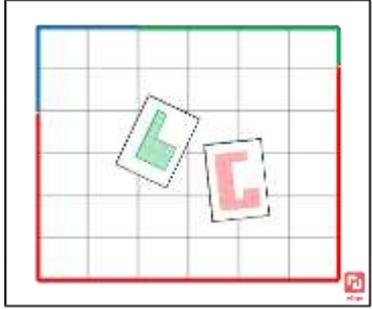
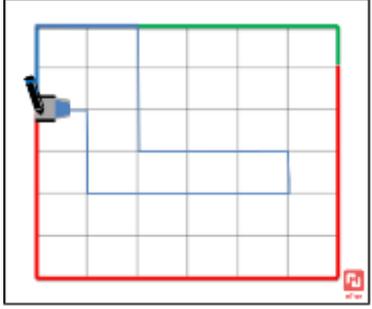
The teams should be as heterogeneous as possible to foster the integration of all students.

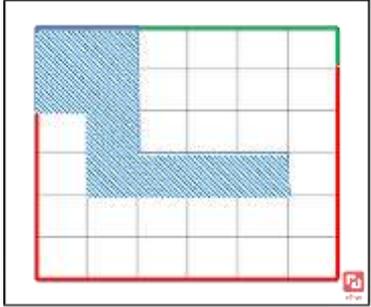
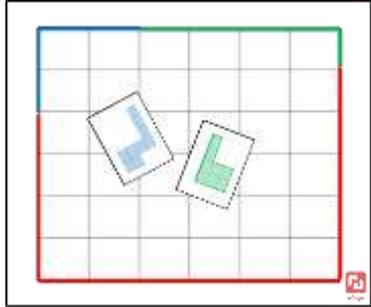
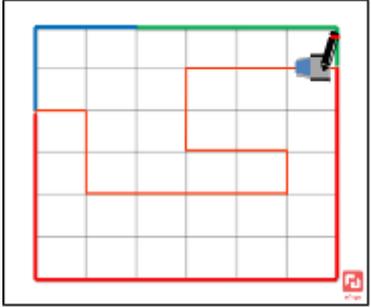
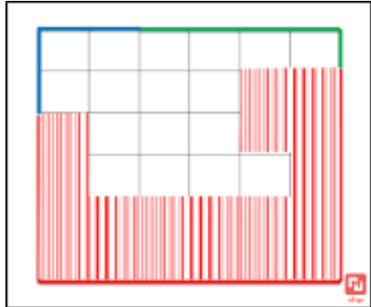
It's important that clear rules are established in terms of group work. This way, it avoids the most active children assuming the lead and the quitter ones only observing.

The teacher must circulate through the various groups to support the activities and the dynamics of each one. In the end, it should promote a collective discussion of the main issues focused and the constraints and difficulties experienced.

## Lesson Plan

				
Preparation	10'	Groups	Divide the class into three groups. Each group will have a set where they will draw the outer limits of every color shape as in the picture. They all have the same puzzle but different pieces to complete it!	
Play	30'	Groups	Group 1 1) Will receive blue and red shapes cards. Their goal will be to find out where is the <b>green</b> area. To do this, they will have to find where the other two colors fit in the Set according to their shape, a number of squares and where they "touch" on the outer limit of the Set.	1) 

📅	🕒	👥	☰	📄
			<p>When they find it, the green shape will then be the remaining area;</p> <p>2) Draw the remaining outer limit of the green shape using the BOT;</p> <p>3) Colour the green area.</p> <p>Important:</p> <ul style="list-style-type: none"> <li>• No drawing inside the grid without the BOT;</li> <li>• The final BOT trajectory does not need to be coded all in once, can be made by multiple steps at will.</li> </ul>	<p>2)</p> 
			<p>Group 2</p> <p>1) Will receive the green and red shapes cards. Their goal will be to find out where is <b>the blue</b> area. To do this, they will have to find where the other two colors fit in the Set according to their shape, a number of squares and where they "touch" on the outer limit of the Set. When they find it, the blue shape will then be the remaining area;</p> <p>2) Draw the remaining outer limit of the blue shape using the BOT;</p>	<p>3)</p> 
			<p>1) Will receive the green and red shapes cards. Their goal will be to find out where is <b>the blue</b> area. To do this, they will have to find where the other two colors fit in the Set according to their shape, a number of squares and where they "touch" on the outer limit of the Set. When they find it, the blue shape will then be the remaining area;</p> <p>2) Draw the remaining outer limit of the blue shape using the BOT;</p>	<p>1)</p> 
				<p>2)</p> 

				
			<p>3) Colour the blue area.</p> <p>Important:</p> <ul style="list-style-type: none"> <li>• No drawing inside the grid without the BOT;</li> <li>• The final BOT trajectory does not need to be coded all in once, can be made by multiple steps at will.</li> </ul>	<p>3)</p> 
			<p>Group 3</p> <p>1) Will receive blue and green shapes cards. Their goal will be to find out where is the red area. To do this, they will have to find where the other two colors fit in the Set according to their shape, a number of squares and where they "touch" on the outer limit of the Set. When they find it, the red shape will then be the remaining area;</p> <p>2) Draw the remaining outer limit of the red shape using the BOT;</p> <p>3) Colour the red area.</p> <p>Important:</p> <ul style="list-style-type: none"> <li>• No drawing inside the grid without the BOT;</li> <li>• The final BOT trajectory does not need to be coded all in once, can be made by multiple steps at will.</li> </ul>	<p>1)</p>  <p>2)</p>  <p>3)</p> 



Play	5'	Class	<p>Time to bring the puzzle together and confirm everybody got it right!</p> <p>Bring all the Sets and stack them on top of each other and see if the patchwork is complete.</p>	

## Resources List & Support Material

### Per each group:

- A robot Kit with drawing capabilities;
- Three markers for each group (easy to erase/clean) – blue, red and green;
- Alcohol for cleaning the scenarios (for teacher use only);
- Transparent scenario with a 6x6 grid; 2X Shape cards (Annex).

## Annexes

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