

## **EXTENSION ACTIVITIES**

## Activity 1 - Ladder

<b>Title</b>	Ladder
<b>eXpresser Objectives</b>	Creating a model with more than one pattern
<b>Mathematical Objectives</b>	<ul style="list-style-type: none"> <li>Making variables and sequences</li> </ul>
<b>Teacher Notes</b>	<p>This activity is a good follow up activity for Traintracks, either as an extension task or as a homework task. It brings up similar issues of linking building blocks, and there are a number of approaches, so it provides a good source of discussion of equivalence.</p> <p>Focus on the requirement for a rung in each Model number – this will mean that some models will need to have the domain limited (recall that this is done by amending the settings in the slider).</p> <p>Students will inevitably unlock more than one number – encourage them to look carefully at what is repeated as the model animates.</p>

### Task/Activity

Students aim to create the Ladder model. Make sure that it works for any number of rungs!

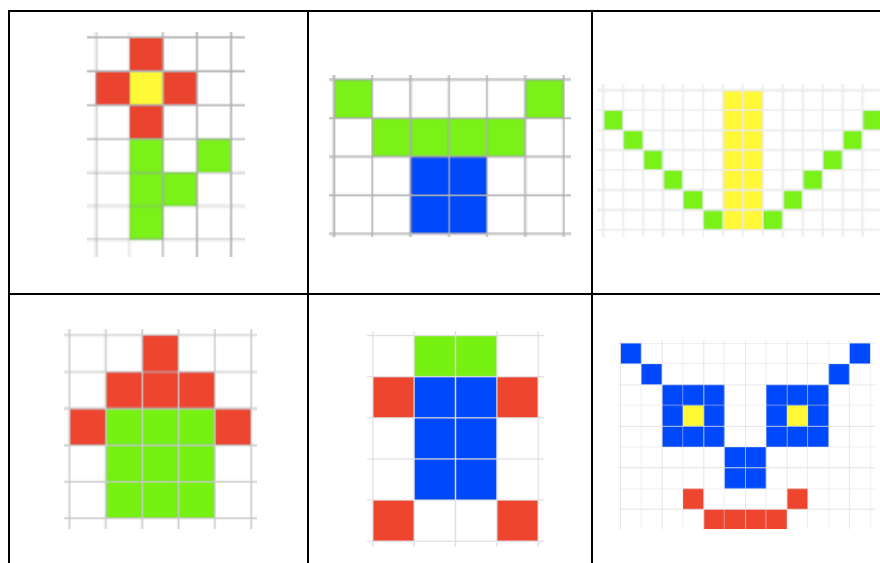
Here is one attempt that did not work. Can you see what is wrong with it?



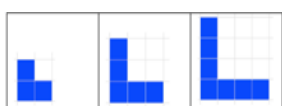
Question: How could this be fixed?

## Activity 2 – Make your own building block

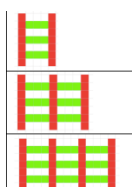
Here are examples of building blocks that can be created:



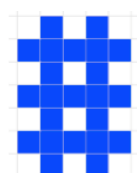
Additional activities aim to take students towards *explicitly* transferring their work on eXpresser to formalising their algebra, by introducing an eXpresser-based context for the development of algebraic skills such as creating and manipulating expressions, substitution and solving equations.



**L-SHAPED**



**FENCES**



**MODEL MATCH**

All of these activities can be worked on individually or in groups. In trials, teachers found small group work on these activities helpful to get articulation of rules and pattern structure, and one-to-one work supported early (or reticent) articulation, such as lower performing students and/or those for whom a transfer from one learning environment to another presents particular challenges.

If students are to work individually (for example, as homework or extension exercise), then encourage their work to be prepared for display – as a poster for example. The move from, and between, the structural to the algebraic and numerical takes time, and needs often revisiting. Giving students opportunities to explain their work and to see other students' examples of work and explanations of structure will help consolidate the learning and provide a reference point for future lessons.