

Intro to Binary: The Determinator

Set up the panel for **D1** or guide the children in setting up **D1**.

Help children read the setup diagram and place the components correctly.

Make sure there are no gaps in the ramps that lead to the trigger lever.

Test the system and demonstrate to children:

Set bit = 1 (pointing to the right) then release one ball.

Ball should drop cleanly to the trigger and then to the end.

Set bit = 0 (pointing left) then release another ball.

Ball should drop into the intercept.

Complete The Determinator Worksheet, SECTION **D1**.

Set the bit on the panel to 0.

Guide the children in marking the *bit setting* column for bit = 0 (See The Determinator Answers).

Guide the children in filling in the *binary notation* column.

Encourage the children to predict how many balls will reach the trigger and the end.

Direct them to write their prediction in the *How many balls reached the end?* column.

Load balls into the top area.

Press the trigger once and observe how many balls reached the end.

Check the results. (See The Determinator Answers.) Children update their answers as needed.

Mark bit the *bit setting* column for bit = 1 and set the bit to 1 on the panel.

Complete the above steps.

Check results.

Complete The Determinator Worksheet SECTION **D2**.

Point out that we read the bit settings on the panel from the bottom upward, so that figure 1 would be read, “zero one”.

For binary notation, we write the binary digits from left to right. See figure 1.

Follow the steps as in SECTION **D1** for bits = 00.

Check results. (See The Determinator Answers)

Follow the above steps for bits = 01 and check results,

for bits = 10, and check results,

and for bits = 11 and check results.

 = 01
figure 1

Complete SECTION **D3** similarly.

Complete SECTION **D4** as follows:

The instructor sets the bits on the panel for each step.

The children read the bit setting on the panel then write the binary number,

They try to predict how many balls will fall to the end and write their prediction in the column.

Balls fall and answers are checked using The Determinator Answers.