

Nim Week – Number Y5/6

You will need:

- Someone to play the games with each day.
This could be a toy character (like an action figure or a Lego person) or an imaginary character (like Harry Potter or Nebula). Choose someone who won't cheat or get too angry if they lose.



- Lots of small things you can use as counters like pasta shapes, Lego bricks, stones, leaves etc.



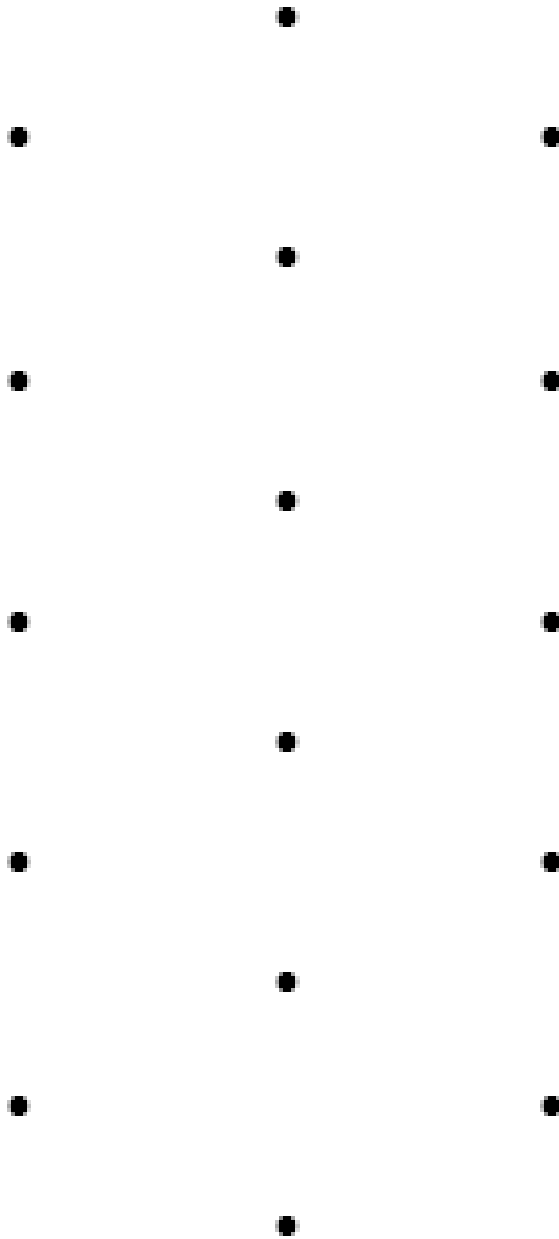
- Printed sheet of dots or dots drawn on paper for day 3

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FINISH



START

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Day 1

- You need a pile of 20 of your counters.
- Take it in turns to take either 1, 2 or 3 counters from the pile.
- The **loser** is the player who takes the last counter.
- Play again, and again...
- Can you find the winning strategy?
- Does it matter who starts?
- Play again but this time the **winner** is the player who takes the last counter. What difference does this make?

Notes for adults working with groups of children

- Help the children to identify key points in the game
- Help them to describe and use the strategy to win.

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Day 2

- Play the game from yesterday but change the rule about how many counters you can take, for example change it to 1 or 2 counters.
- Play again, and again...
- Can you find the winning strategy?
- Does it matter who starts?
- Now change the rule again, deciding on a different number of counters you can take each time for example 1, 2, 3 or 4. Play the game with the new rule.
- What difference does this make to the winning strategy?

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Day 4

- Players take turns to choose any number from 2 to 10 and add, keeping a 'running total'.
- Record the number a player chooses and the running total each time.
- The player who makes the total exactly 100 is the winner.

Stan	Hulk	Running Total
10		10
	5	15
8		23
	8	31
2		33
	9	42
9		51
	9	60
8		68
	9	77
9		86
	10	96
4		100

- Play again, and again...
- Can you find the winning strategy?
- Is your strategy like the ones you had on days 1, 2 or 3?
- Does it matter who starts?

Notes for adults working with groups of children

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- Help them to describe and use the strategy to win.

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Nim Week – Number Y5/6

Day 5

- Players take turns to choose any number from 5 to 10 and add, keeping a running total.
- Record the number a player chooses and the running total each time.
- The player who makes the total reach 100 exactly **or** makes their opponent 'go bust' (go over 100) is the winner.
- Play again, and again...
- Can you find the winning strategy?
- Is your strategy like the ones you had on days 1, 2 or 3? Is it the same as yesterday?
- Does it matter who starts?
- Make up your own game that involves making decisions to either add to make a target number, subtract to reach zero or move a counter towards a finish line. Play your game; what is the winning strategy?

Notes for adults working with groups of children

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- Help them to describe and use the strategy to win.

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