Barefoot

from Computing at School | BT

Mini Missions
to build computational thinking skills

Our quick, easy to do activities provide fun ideas to get children practising their computational thinking skills.

Split into the six computational thinking concepts it's easy to discover new ways to introduce and reinforce learning from school and at home.

Algorithms – Making steps and rules

Cooking

Activity

Make something to eat with your child. Can they draw or write the instructions (an algorithm) for someone else to follow to recreate the dish?

Learning

Algorithms are used in everyday life, such as recipes. It is just producing a set of instructions or rules which can be followed accurately.

My Amazing Game

Activity

Ask your child to invent a game to play around the house and write out the rules (an algorithm). Play the game with them - do the rules explain everything about how to play? Can you find any loop holes in their rules?

Learning

Algorithms can be rules as well as a sequence of instructions. The rules need to be precise and specific.

Robotify Me

Activity

Ask your child to write the instructions (an algorithm) for something they've done today?

Would a robot version of themselves be able to follow this? Is their algorithm precise enough? Test it!

Learning

Here your child has written an algorithm. Algorithms are a precise sequence of instructions or set of rules for completing a task.

Timetable

Activity

Ask your child to create a step-by-step timetable for tomorrow. What will they do first? Next? Then? Can they present their timetable in an easy to read format for others to follow?

Learning

Algorithms can be presented in different ways, here our timetable showing what we will do first, second, next is an algorithm.

Teddy Hunt

Activity

Ask your child to hide their teddy/toy in another room in the house. Ask them to draw, write or speak the instructions (an algorithm) for someone to find it. They need to be precise with their instructions if they want their teddy found quickly!

Learning

This activity helps demonstrate why algorithms need to be precise. If they're not, the teddy won't be found!

Abstraction – Removing unnecessary detail

I Tell

Activity

Play the game, 'I Tell' with your child which is like 'I spy', but you use 3 adjectives to describe the item you're thinking of and see if the other person can guess it.

Learning

Abstraction is about simplifying things and focusing on important information. This game helps your child focus on the important adjectives which describe what they're thinking of.

Abstract Art

Activity

Create a piece of abstract art with your child. Choose an inspiration for your art (person, object, view) but rather than recreating this exactly, use simplified shapes to represent what you can see. E.g triangles for trees, or an oval for a face

Learning

Here your child is creating an abstraction within their artwork. They're not trying to reproduce what they see exactly, but are representing key features with simplified shapes.

Timetable

Activity

Ask your child to create a timetable for tomorrow set out as a table. What are the key activities they will do? How will the day be structured?

Learning

A timetable is an example of an abstraction as it contains key events but doesn't include unnecessary detail – like 'nipping to the toilet between English and Maths'!

5 Word Film Game

Activity

Ask your child to think of a film. Ask them to describe it using 5 key words or less. Can you guess the film they were thinking of?

For example: Princess, Prince, Snowman?

Learning

This game encourages your child to abstract as they think of the key features of the film to help someone guess.

My Magnificent Movie

Activity

Ask your child to create a storyboard for a movie they'd like to make which provides a summary of the main events in the plot.

Learning

The storyboard your child creates is an abstraction as it summarises their ideas for a movie, providing the key features and not all the detail.

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Evaluation – Making judgements

WWW

Activity

We're not talking about websites here, but 'What Worked Well!' Ask your child about the work they completed yesterday, what went well? How do they know – what criteria are they using to measure their success against?

Learning

Evaluation is about making judgements in a systematic way. Here your child is evaluating their own efforts by considering what criteria to judge themselves against.

Be a Critic

Activity

Ask your child to write a review of a book or film. Before writing the review, come up with a set of success criteria. E.g. exciting plot, interesting characters

Learning

Here your child is evaluating the work of others against a set of criteria which they have defined. They are making systematic judgements.

My Daily Workout

Activity

Ask your child to design a workout for members of their family. Consider what would make a good workout first, and create a success criteria list.

Try your child's workout with your family and ask everyone to evaluate it against the criteria.

Learning

Here your child identifies the criteria for evaluation of a successful workout. They receive feedback on their workout against these criteria.

A New Healthy Sandwich

Activity

Can your child come up with a sandwich that both tastes great and is healthy? Let them create their sandwich and evaluate it themselves. Have other family members try it and give feedback too.

Learning

Here your child has been given a challenge and the criteria against which it will be evaluated. They self evaluate their own efforts and receive feedback from family members.

Be an Engineer

Activity

Using any construction materials, challenge your child to build the tallest tower. Discuss success criteria – it must stand up on its own for example. Encourage your child to regularly evaluate their tower against the criteria and use this evaluation to make changes.

Learning

Your child is regularly evaluating their tower and making use of their ongoing self evaluation to inform changes in their design.

Decomposition – Breaking down into parts

Break it Down

Activity

Ask your child to choose an item they can see. Ask them to sketch it and break it down by labelling as many different parts as possible. This can be run as a competition – who can break it down the most?

Learning

In computing decomposition allows us to break complex tasks into more manageable tasks. Here your child practises decomposing objects around them.

Design your ideal back garden

Activity

Ask your child to look at their own garden or think of a local green space and break it down into different parts.

Grass, patio, decking, pond, vegetable patch. Get them to design their own perfect garden by sketching ideas for each part.

Learning

Here your child has made the task of designing a garden easier by breaking it down and looking at each section separately.

Comic Flick Book

Activity

With your child, cut, fold and staple paper into a little flick book. Ask them what they want to happen in their animation and together break this down into steps for the drawings on each page.

Learning

Here your child has decomposed the animation into a sequence of individual images. What other animations can your child create?

Design an App

Activity

Ask your child to think up a new app. This could be a game, fitness or travel app for example. Ask them to create a design for the app by breaking it down and sketching out the different screens the user will see.

Learning

Decomposing the app down into the different screens allows your child to create a design to illustrate how their app would work.

Dodgy Dance Moves

Activity

With your child select a favourite party song which you can learn the dance to, such as the YMCA or Macarena. To learn the moves, break the song down into different sections, then look at the actions for each section.

Learning

Decomposing the dance sequence down into verse, chorus and then smaller chunks makes the task of learning the moves easier.

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Pattern - Spotting and using similarities

Garden grab
Activity

Ask your child to pick a range of leaves or petals (carefully) and sort them based on similarities and differences. How many different ways can they sort them? What features are they using to sort them?

Learning

Your child is making careful observations and identifying similarities and differences between objects, which helps identify patterns.

What's next?
Activity

Using a variety of fruits or other suitable food (e.g. pasta pieces) arrange a repeating pattern and ask your child to predict what comes next and explain how they know.

Learning

By spotting similarities and differences, your child can identify patterns and create rules to predict what comes next.

Tidy up!
Activity

Ask your child to tidy their wardrobe! Can they sort their clothes based on similarities? They could sort by colour, purpose or even how much they like wearing them.

Learning

Identifying similarities and differences between objects helps us to identify patterns. Here your child might spot a pattern that all their favourite clothes are yellow for example.

Kitchen cupboards
Activity

Ask your child to help sort the kitchen cupboards. What food goes where and why? Can your child spot patterns in where different foods are stored? Can they use these patterns to predict where new food from the shops might be stored?

Learning

Your child is identifying similarities and differences and spotting patterns, which can help them to make predictions about where new foods might be stored.

And the next number is...
Activity

Provide your child with a range of number sequences which follow a rule, for example: 2,4,6,? or 3,8,18,? Can they work out the rule and give the next number in the sequence?

Learning

By spotting similarities between each consecutive number, we can work out rules which govern patterns and predict what will come next.

Logic – Predicting and analysing

Noughts & Crosses
Activity

Play this classic game with your child. This game is full of logical thinking. Ask your child to explain where they plan to go with each move and why.

Learning

This game encourages your child to think logically about the implications of each move. Encourage them to share their thought process.

Magic Square
Activity

Provide your child with a 3x3 square. Can they add the digits 1-9 using each digit once so that all the rows, columns and diagonals add up to 15? Encourage your child to explain their thinking as they tackle the challenge.

Learning

This maths puzzle helps your child develop both trial and improvement, and logical reasoning skills.

Boxes
Activity

With your child, take turns to join dots with a line on dotted paper. Whoever completes a square puts their initial in it and gets an extra turn. The winner is the player with the most completed squares.
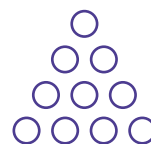
Learning

This game encourages your child to think logically about the implications of each move so as not to give their opponent the advantage.

Triangles
Activity

Ask your child to lay 10 objects to create a flat pyramid pattern:

Challenge them to move only three items so the triangle points downwards instead of upwards?

Learning

To complete this puzzle your child must think logically about which items to move. Encourage them to share their thought process.

Bedroom BattleShips
Activity

Play this classic game with your child by creating a giant grid and using a variety of teddys to represent ships. Encourage your child to think logically about where to strike next and why.

Learning

Once you've got a 'hit', this game encourages your child to think logically in order to try and sink the ships (teddys) with as few shots as possible.