

A large graphic on the left side of the page. It consists of a red rectangular block with the word 'GO' in white, and a yellow rectangular block below it with the words 'BUILD A FUTURE' in white. To the right of the red block are three small red squares of varying sizes. The background of the entire page is a photograph of a large steel bridge structure under construction, with a tall orange crane visible against a clear blue sky.

GO

BUILD
A FUTURE

Building Bridges CREST Challenge

PARTICIPANT GUIDE TO CRITICAL
PATH ANALYSIS



A British Science Association programme



WHAT IS CRITICAL PATH ANALYSIS?

This technique is used to plan all sorts of projects. It works really well in construction and the built environment because it helps to ensure things happen in the right order and projects fit into the shortest possible timeframe. The best way for critical path analysis (CPA) to work is to keep it simple. There are many methods used, but this adapted version will work for this project and give you an idea of the principles without getting too complicated.

GETTING STARTED

You will need:

- Some squared paper, with squares 1cm x 1cm or smaller
- A spare site plan sheet, overlaid with 25 x 40 1cm x 1cm boxes
- Scissors
- Blu Tack or small Post-it or sticky notes.

METHOD

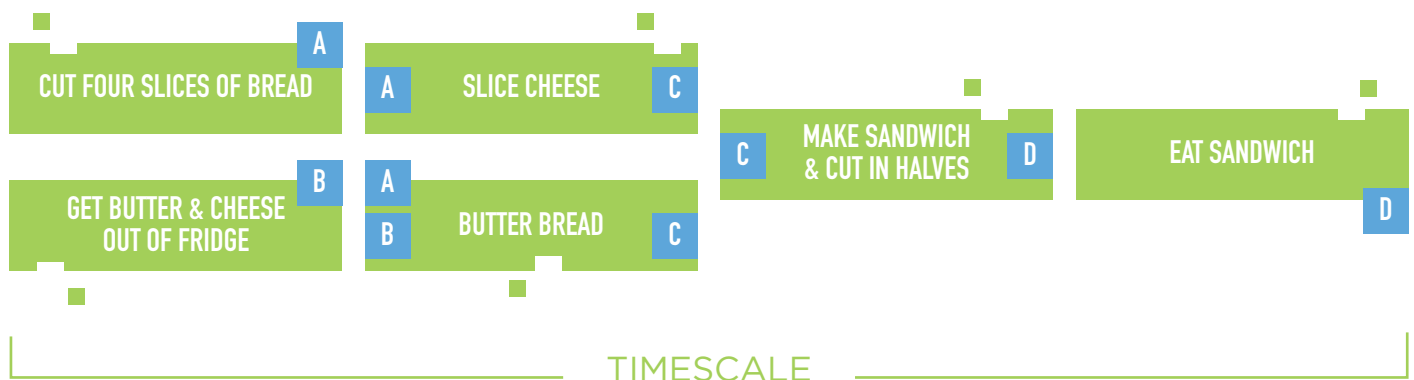
1. Agree on a list of the key tasks you need to do to complete your project
2. Work out how long each task will take, and how many members of the team are needed to complete it. Try to ensure that a task can be completed in one session (ask your activity lead how long each session will be). If you think it will take longer, divide it between two or more people so that it can be done in one session
3. Cut out strips of the squared paper. The length of the task in quarters of an hour should be the length of the strip, and the number of people it will take to complete the task should be the height of the strip. For example, if a task will take 45 minutes, cut a strip 3cm long. If two people are needed to do the job, cut the strip 2cm high
4. You can fit 10 hours (as 40 boxes representing 15 minutes each) along the longest edge of an A3 sheet of squared paper. Put a scale for this along the top edge, dividing the time into the sessions you will have to work on the project
5. Decide which other tasks have to be completed before each task starts (these are called 'dependencies'). For example, if you're building a house, you can't put the walls up until the foundations are laid and have dried
6. When you lay out your critical path, start with the tasks which don't depend on any others being done before they start
7. Fit enough of these into the first session so everyone has something to do for the whole session. Spread them evenly down the page
8. Then work out which tasks depend on each of those first tasks being done. Lay these out in the second session so everyone in the team has something to do for the whole session
9. If a task needs other tasks to be completed before it starts, you need to make sure you put it in your schedule to start after all the required tasks are finished
10. Check the plan and then stick each task to the A3 sheet with Blu Tack or sticky notes. This means your activity lead can photocopy your plan for each team member, but you can still move tasks if you need to as the project goes on.

EXAMPLE

Here's an example of a critical path analysis for making a cheese sandwich. Two people were involved, so you can see that there aren't any tasks allocated to more than two people.

At any point two people are doing the same task (eating!) but mostly they work on separate tasks. If one person had to do all the tasks that would otherwise be shared between the two, it would take twice as much time and the order would be different.

You can see that you can't slice cheese until it's out of the fridge and you can't butter bread until you've (a) cut the bread and (b) got the butter and cheese out of the fridge. If you separate the two things you have to get out of the fridge it will take longer, as you'll have to open and close the door twice. Critical path analysis can help spot inefficiencies like this, where time is wasted, so it's important to follow your plan through when you've written it.



When you start to develop your critical path analysis, using a table like this to order your tasks will really help. We've also provided a table you might choose to use for your final version (see the document 'Critical Path Planning Table')

1	2	3	4	5
NUMBER	TASK TITLE	TIME REQUIRED	PEOPLE REQUIRED	DEPENDENCIES
Number each task (this is easier than using letters, as in the example, when you have lots of tasks)	Give it a title	Work out how long it will take, and how many people (you can amend these as you go through the tasks)	Work out the 'dependencies' (tasks which have to be done before another task starts)	Make your plan

Remember to check progress against the plan at the end of each session

GO

MAKE A DIFFERENCE

For more information on
CREST Awards and Go Construct

Please visit

goconstruct.org

Or contact

experience@goconstruct.org

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