



## Think, Solve, Succeed: Maths and Careers in Action

This resource aims to extend children's understanding of the job opportunities that await them in their local community and beyond. It particularly stresses the value of **applying mathematics in real-life employment** contexts, both to further their view of the relevance of mathematics and to increase the sense of fulfilment in undertaking meaningful employment.

Positioned on this backdrop, the resource comes as one of a series of lessons that provide a school with an engaging and impactful dimension to their 'problem-solving' curriculum. Central to the experience children gain from the resource is **the sense of visiting a local business or organisation**; in this case, the North East Combined Authority, Economic Growth and Innovation Directorate, and we extend our thanks to them.

Another North-East dimension to this resource is that it is made by 'Winning With Numbers', a local organisation with a national reputation. **Winning With Numbers** is a 'Phonics for Maths' approach that provides a school with access to a structured and systematic programme, ensuring every child acquires basic and essential number fluency. This primary maths programme identifies 300 pieces of number knowledge and puts them in a straight-line sequence of learning. All 300 parts come with a comprehensive suite of digital teaching, learning and teacher-training resources.



### Year 6

This resource centres on the use of a video that teachers can play in class. The video takes the children through the intentions described above and culminates in a virtual visit to The Economic Growth and Innovation Team at the North East CA, where we meet an employee called Carolyn. The children are tasked with supporting Carolyn in her work. This necessitates problem-solving, interpreting data and reasoning, as well as making 'real-life' considerations regarding the context. Teachers are urged to pause the video where suggested, allowing children space to think through each part of the scenario for themselves. The notes below can be used as a prompt for the teacher in 'being ready' to support children who need guidance to advance solving the problems. Naturally, teachers are encouraged to scaffold, adapt and extend the activities to suit their own children's needs, asking children to represent their thinking using a variety of images, symbols and words. Much of the thinking expected can be revisited, strengthening the learning, by altering the numbers or the employment scenarios; asking, 'What if...?'.

### Year 6 National Curriculum links

#### Ratio and Proportion: Statutory

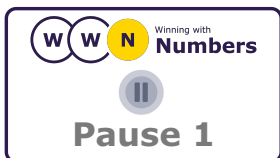
Pupils should be taught to:

- solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.

#### Ratio and Proportion: Non-statutory

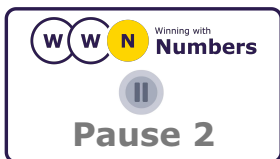
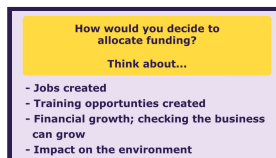
Pupils recognise proportionality in contexts when the relations between quantities are in the same ratio (for example, similar shapes and recipes).

Pupils should consolidate their understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems. They might use the notation  $a:b$  to record their work.



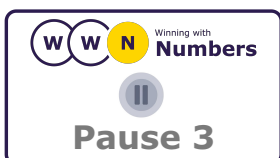
### How would you decide to give the funding or not?

**Possible Outcomes:** This is a very open initial brainstorming session to get children thinking for themselves about what criteria may be relevant when considering allocating public funding to a bid for economic development. At first, just let children run with their own ideas. The video up to this point has sewn the seeds for the areas of concern; jobs created, courses provided, environmental impact and ability to sustain the business. To support a successful start to the overall investigation, these discussion prompts are supplied just after the pause screen at this stage.



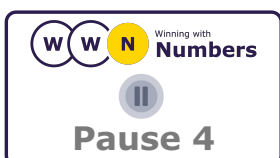
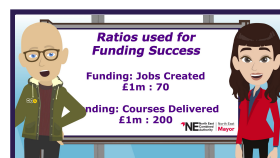
### Does Carolyn accept the bid?

**Possible Outcomes:** This is another open-ended discussion, since no specific criteria have been provided at this point. Again, leave children to think hard and express any constructive thoughts, valuing them if they seem relevant even if they do not take the direction that the video takes as it progresses.



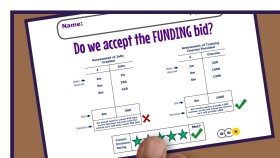
### Now we know the criteria, does Carolyn accept the bid?

**Possible Outcomes:** Again, it is useful to give all children time and space to think through their own plan. Can they note down relevant information? Can they organise it into a system that will progress them to knowing if the bid meets the criteria? Can they justify their findings in calculations and in words? For children that need extra support, it might be useful to play the video through the pause screen to see the example workings provided. There is a worksheet provided here so that children can then use the same layout to record and justify their proportional reasoning. Consider giving children similar simple questions to practice before they move into the bulk of the activity.



### Does Carolyn accept these three bids?

**Possible Outcomes:** This is where the bulk of the task is met. The children deliberately are given all 3 bids to consider at once; this mimics real-world workplace contexts and prompts children to break the task down into manageable parts. Each of the 3 companies has 3 considerations to be made; jobs created, training course provided and carbon emissions ratings. Many children may go about the calculations in a different way, for example by dividing the bid figures appropriately (e.g. by dividing £15m by 15 and the projected jobs created by 15 to then be able to compare the bid to the success ratio by a 1:1 comparison. Some children may choose to use multiplication, but not use proportional parts as the examples provide and the worksheet encourages (e.g. by multiplying the jobs needing to be created by the success ratio by 15, instead of finding the 10th multiple and the 5th multiple of 70 and adding these parts together). This method has been used in the examples as it provides (or reinforces) a strong conceptual foundation for proportional reasoning, and so it is highly recommended that the teacher presses pause over these examples and narrates through the figures with extending questioning and further examples.



Name:

# Do we accept the FUNDING bid?

| Assessment of Jobs Created |      | Assessment of Training Courses Provided |         |
|----------------------------|------|-----------------------------------------|---------|
| £                          | Jobs | £                                       | Courses |
| Ratio →<br>required<br>1m  | 70   | Ratio →<br>required<br>1m               | 200     |
| Bid →                      |      | Bid →                                   |         |
| Decision →                 |      | Decision →                              |         |

|                        |                                                                                     |      |
|------------------------|-------------------------------------------------------------------------------------|------|
| Carbon Emission Rating |  | Met? |
|------------------------|-------------------------------------------------------------------------------------|------|



Name:

# Do we accept the FUNDING bid?

| Assessment of Jobs Created |      | Assessment of Training Courses Provided |         |
|----------------------------|------|-----------------------------------------|---------|
| £                          | Jobs | £                                       | Courses |
| Ratio →<br>required<br>1m  | 70   | Ratio →<br>required<br>1m               | 200     |
| Bid →                      |      | Bid →                                   |         |
| Decision →                 |      | Decision →                              |         |

|                        |                                                                                      |      |
|------------------------|--------------------------------------------------------------------------------------|------|
| Carbon Emission Rating |  | Met? |
|------------------------|--------------------------------------------------------------------------------------|------|



# W W N

## Winning with Numbers

|                                                                                                                         |          |                     |  |                             |  |
|-------------------------------------------------------------------------------------------------------------------------|----------|---------------------|--|-----------------------------|--|
|  North East<br>Combined<br>Authority |          | North East<br>Mayor |  | <b>Economic Growth Team</b> |  |
| Name of Company:                                                                                                        |          | GreenWave Tech      |  |                             |  |
| Funding Requested:                                                                                                      |          | £11 Million         |  |                             |  |
| Jobs to be Created:                                                                                                     | 780      |                     |  |                             |  |
| Courses to be delivered:                                                                                                | 2500     |                     |  |                             |  |
| Carbon Omissions Rating:                                                                                                | ★★★★     |                     |  |                             |  |
| Bid for Funding Accepted?                                                                                               | Yes / No |                     |  |                             |  |
| Signed:                                                                                                                 | Carolyn  |                     |  |                             |  |

|                                                                                                                         |          |                     |  |                             |  |
|-------------------------------------------------------------------------------------------------------------------------|----------|---------------------|--|-----------------------------|--|
|  North East<br>Combined<br>Authority |          | North East<br>Mayor |  | <b>Economic Growth Team</b> |  |
| Name of Company:                                                                                                        |          | BioNex Diagnostics  |  |                             |  |
| Funding Requested:                                                                                                      |          | £6 Million          |  |                             |  |
| Jobs to be Created:                                                                                                     | 300      |                     |  |                             |  |
| Courses to be delivered:                                                                                                | 1600     |                     |  |                             |  |
| Carbon Omissions Rating:                                                                                                | ★★★★★    |                     |  |                             |  |
| Bid for Funding Accepted?                                                                                               | Yes / No |                     |  |                             |  |
| Signed:                                                                                                                 | Carolyn  |                     |  |                             |  |

|                                                                                                                       |          |                       |  |                             |  |
|-----------------------------------------------------------------------------------------------------------------------|----------|-----------------------|--|-----------------------------|--|
|  North East<br>Combined<br>Authority |          | North East<br>Mayor   |  | <b>Economic Growth Team</b> |  |
| Name of Company:                                                                                                      |          | PolyFusion Composites |  |                             |  |
| Funding Requested:                                                                                                    |          | £13 Million           |  |                             |  |
| Jobs to be Created:                                                                                                   | 950      |                       |  |                             |  |
| Courses to be delivered:                                                                                              | 2760     |                       |  |                             |  |
| Carbon Omissions Rating:                                                                                              | ★★★★★    |                       |  |                             |  |
| Bid for Funding Accepted?                                                                                             | Yes / No |                       |  |                             |  |
| Signed:                                                                                                               | Carolyn  |                       |  |                             |  |