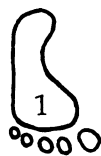


Contents

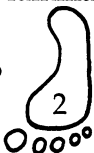
Preface	iv
Brainstrain Contents	v
Explanation of Symbols	viii
Steps in Using the Brainstrains	ix
Marking and Follow-up	x
Brainstrains 1 - 50	1
Historical Facts and Solutions	52
Appendices	
Brainstrain Chronology	125
Research Levels	129
Research Guide	132
Time Line Blank	134
Outline Maps	135
Index to Mathamatical Concepts	253

Steps in Using the Brainstrains

Each Brainstrain covers one or more areas of mathematics. Each also has a Difficulty Rating(DR); this gives an approximation of the grade level it is aimed at (see Page vii). Brainstrains with a DR of 9 or 10 may take 40 minutes or longer to solve, others 10 minutes or more.



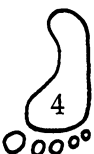
Check Index (on pages 153–54) for an area of mathematics your class is familiar with. Choose a Brainstrain covering that area.



Find that Brainstrain in the Brainstrain Contents. Can your children cope with the other areas of mathematics involved in that problem? If so go on to Step 3, if not go back to Step 1.



Read the Solution for that Brainstrain. Do you understand how to solve the Brainstrain? If you do, and you think this Brainstrain is appropriate for your children, go to Step 4. If not, go back to Step 1.



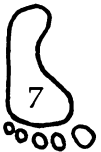
Work out how many photocopies you need of the sheet — generally, the more the better. Will the children be tackling this Brainstrain in small groups (some of the more difficult Brainstrains can be done in pairs or threes) or individually?



Check that you have materials that might be needed, like calculators, spare lead pencils, rulers, protractors, set squares, blocks, atlases, extra paper, counters, containers, coloured pencils and for No. 33, scissors and paste.



Hand the Brainstrain out to the children. You must read through it with them, even if it is to be a homework exercise. They can then ask questions which you can answer to whatever degree you feel is necessary. You can even review the maths involved.



Make sure you explain to the children that the information in italics in the Brainstrain is historical fact, while the rest is fictional.

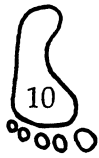


The children must be prepared to show their working of the problem, as outlined in the Solution section even if they have taken a short cut to the answer. Usually their answers can be recorded on the question sheet next to the appropriate step — *a, b, c* etc.



Move around, watching and listening while they are working. Don't dive in and help them straight away. They have to learn to reason, organise and prioritise for themselves — really strain their brains! Only assist when they seem totally lost.

Marking and Follow-up



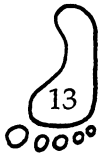
Once the children have worked through the Brainstrain, mark the work as a class group. Children should be prepared to show the steps they used in solving the problem. Have some of the children explain how it is solved. Make sure you have the Solution with you as a backup.



Ask the children to find out more information on one or more of the Brainstrain's Research topics. They can orally report the next morning. Make sure they stand up straight and speak loudly and clearly! You can now read the information from the Historical Facts section aloud to them.



Hand out a copy of the relevant outline map (see Appendix) to them. They should have already labelled the world outline map with major oceans and regions. They should shade in an outline of the country relevant to the Brainstrain just completed and use an atlas to place its capital city.



Using the Time Line Blank or class time lines (see Extra Ideas) plot the main dates associated with the Brainstrain.



You are now into the research skill development phase. Check which level your children would be on (see Research Levels in Appendix) and if appropriate, make a class set of photocopies of an article as indicated in that Brainstrain's Research topics list.



Use the Research Guide (see Appendix) if you need to, to underline the main points in the article, before leading your class to do the same. Have them write up their one page (or more) summary neatly, accurately and attractively in class time or for homework.



Have the best two samples of work displayed permanently on the Wall Of Honour (for excellent work) within the classroom. Use the Brainstrains and these steps as often as you feel you can to increase the children's knowledge and understanding of the world around them and improve their research skills.

Brainstrain 1: Challenge at Olympia

DR: 8

Olympia, in Greece, was the site where the gold and ivory statue of Zeus, king of the gods, once stood. Listed as one of the Seven Wonders Of The World, the statue was destroyed around the 5th Century AD.

Famous temples and statues once covered the area now better known as the birthplace of the Olympic Games. Held every four years from 776 BC till they were abolished by Roman emperor Theodosius I in 393 AD, they grew from the original foot race as time progressed.

In 1892 a Frenchman, Baron Pierre de Coubertin, revived the idea of the Games — with the first modern event in Athens in 1896.

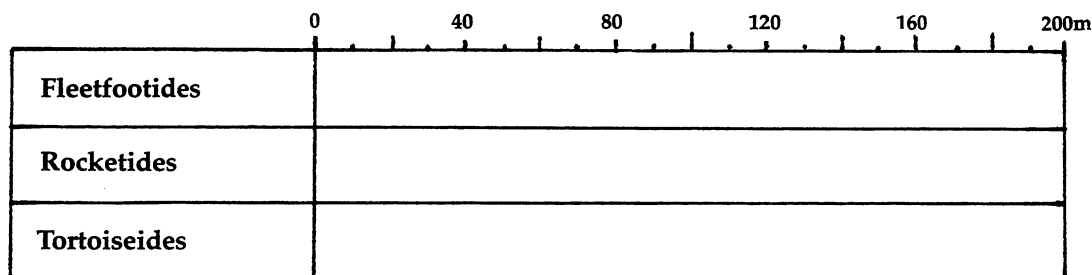
The crowd is excited, the athletes are nervous — it is the 200 m Final in the Games of ... take your pick...736 BC! The unmarried girls are watching attentively (married women aren't allowed in)...the robes are put aside...

...Sorry to interrupt the 'broadcast', but here is the information on how each of the three runners will perform:

Fleetfootides — slave from Sparta — runs at 8 m per sec speed.

Rocketides — soldier from Athens — 27 km per hour pace.

Tortoiseides — olive picker from Marathon — 100 m in 12 sec.



If each ran at his usual speed for the 200 m:

- Draw a line on the diagram to show where each would be after 20 seconds of the race.
- What would be the actual finishing order?



The Olympic Games
Pierre de Coubertin
Olympic Sports
Ancient Greece - History and Map