**Building our brains**

**Suggested programme outline**

The concepts can be delivered as discrete lessons or embedded throughout the delivery of the core curriculum. The intervention can take as long as you wish or focus on a 5/6 week plan.

This document is intended to be used as a guide only and it is expected that teachers will adapt and augment the delivery of the programme to meet the needs of their individual learners.

**Key concept 1**

Introduction to the brain and ‘intelligence’

**Learning objectives**

Pupils will demonstrate an awareness of the following concepts

* Intelligence is not a fixed trait and is not restricted to one area of ability
* effort and practice can help our brains to grow and increase our skills in particular areas

**Top tip!**

Give the pupils sticky notes to write down any questions they have. Store them in a box to be answered at start of the next lesson or at end of the intervention. Alternatively, the pupils could be given an opportunity to do some on-line research to find the answers out themselves.

**Discussion points**

* What are some things that you are good at doing?
* Were you always good at this activity or did you have to practice?
* Are there people in your family with similar skills?
* What are some things that you would like to become better at doing?
* How do you think you might improve your skills?

**Suggested activities**

* Explore the different strengths of each pupil in the class e.g. who is a fast runner? Who helps when someone is upset/angry? Who can play a musical instrument? What aspects of ‘intelligence’ do these skills display?
* Explore the skills the children have learned since they were a baby and what helped them to progress e.g. learning to talk/walk/ride a bike/play an instrument – focus on repetition
* Use diagram provided to explore multiple intelligences (appendix 1)
* Study the pictures of people doing different tasks and explore which ‘intelligence’ or skill they are demonstrating (appendix 2)
* Carol Dweck Self-portraits- example of practice and improvement. Exploration of core beliefs about what we are good/not good at. How does this affect our behaviour? (appendix 2)
* Read Brainology article-you can grow your intelligence: <https://www.mindsetworks.com/>

**Key concept 2**

The brain is like a muscle

**Learning objectives**

Pupils will demonstrate an awareness of the following concepts

* The brain is like a muscle- the more you use it the stronger and more developed it will become

* When we learn new things the connections in our brain become stronger (neuroplasticity)
* The brain is made up of brain cells or neurons and is around 1,5kg in weight with a walnut like texture

**Top tip!**

Look online for art projects- there are plenty of ideas on Pinterest. The pupils could make brain cells from pipe cleaners then join these together as they learn something new.

**Discussion points**

* What is a brain? what does it feel like? How much does it weigh?
* How big is your brain?
* Are all brains the same?
* Why do we have a brain?
* What does your brain do?
* Do all living creatures have a brain?
* How do you think our brain is different from that of animals?

**Suggested Activities**

* Prof Winston video clip to demonstrate how brain connections develop <https://www.youtube.com/watch?v=t4np5wLAhWw>
* Make a rubber band ball to demonstrate the ‘elastic’ nature of our brain (see book- “My Fantastic Elastic Brain”)
* To further reinforce the concept of brain malleability and plasticity, provide each student with a ball of clay and encourage them to stretch and mould it into the shape of their own brain
* Explore Models of brain, grapefruit (size), walnuts (texture) and flour (weight)
* Pupils can create their own models/representations of the brain
* Use string to demonstrate the formation of brain connections (more links makes it stronger)
* Compare brain weights of different animals- is there a link between brain size and intelligence- <http://www.themost10.com/intelligent-animals/>
* Video clip- facts on the brain <https://faculty.washington.edu/chudler/flash/facts.html>
* Complete brain growth tracker activity from ‘Your Fantastic Elastic Brain’ <http://news.littlepicklepress.com/lesson-plans-your-fantastic-elastic-brain>

**Key concept 3**

The human brain is unique

**Learning objectives**

Pupils will demonstrate an awareness of the following concepts

* The main areas of the brain and their function: Frontal lobe, Motor cortex, Cerebellum, Occipital lobe, Parietal lobe
* Different activities activate different areas of the brain- the more they are used, the stronger the connections will be
* Current techniques only allow us to view a very some of what is happening in our brains

**Discussion points**

Children can be encouraged to wonder and think critically about their brains:

* How is my brain organized?
* How does my brain solve problems and make decisions?
* Am I only using one part of my brain at a time?

**Suggested activities**

* Explore images of aMRI, fMRI and EEG. What do these images tell us about the brain and how much is still unknown? (appendix 3)
* Try learning a new activity as class and track progress- e.g. juggling. Discuss which part of the brain is being strengthened through this activity
* Link activities to the parts of the brain that they activate – try playing a game or doing an activity that requires spatial awareness e.g. map reading. There are lots of ideas for this in the ‘It’s Mindboggling’ resource- <https://www.dana.org/uploadedFiles/The_Dana_Alliances/European_Dana_Alliance_for_the_Brain/mindboggling_en.pdf>
* Make models of the brain or do a colouring/matching activity to link the parts of the brain to their function
* Try doing the Stroop test- discuss what this tells us about our brain and left/right functioning- <https://faculty.washington.edu/chudler/words.html>
* Introduce the olfactory lobe using the Jelly bean experiment. Our brain processes most of what we taste and not our tongue. Try tasting a jelly baby or skittle while holding your nose, then let it go
* Review brain growth tracker activity

**Key concept 4**

Growth and fixed mindsets

**Learning objectives**

Pupils will demonstrate an awareness of the following concepts

* Researchers have found there are two different ways of thinking about or approaching problems- fixed mindset and growth mindset approaches
* People with a growth mindset believe that ability can be increased with effort and practice
* If we approach a task with a growth mindset we are more likely to succeed
* Making mistakes is a good strategy. It leads to skill development and brain growth

**Top tip!**

Explore the stories of famous sporting heroes or musicians who have developed their skills through hard work and perseverance, e.g. Andy Murray

D**iscussion points**

* What sort of mindset do you think you have? How do you know?
* Which mindset is most helpful when learning new things
* Have you ever made a mistake?
* How did it feel when you made the mistake?
* What happened after you made the mistake?
* What sort of Mindset do successful people usually have?

**Suggested activities**

* In pairs create a slogan or phrase that explains growth mindset e.g. ‘practice makes perfect’. These could then be displayed around the classroom/school
* Organise a list of phrases into growth mindset or fixed mindset categories (appendix 4)
* Explore times when you have made a ‘great mistake’- what did you learn from this? What did you do differently the next time?
* Video of ski slope- which Mindset do we see here and how does it change? Is learning new things easy? Can it sometimes be scary?

<https://www.youtube.com/watch?v=ebtGRvP3ILg>

* Explore the learning pit and what this tells us about viewing learning as a challenge <http://www.jamesnottingham.co.uk/about/learning-pit>
* Use the Think Aloud strategy to demonstrate how you learn from mistakes and failure [www.teachervision.com/skill-builder/probelmsloving/48546.html](http://www.teachervision.com/skill-builder/probelmsloving/48546.html)

**Key concept 5**

Growth mindset and self-talk

**Learning objectives**

Pupils will demonstrate an awareness of the following concepts

* Planning ahead and controlling impulses are key strategies in learning new things
* Perseverance and hard work are important in achieving goals
* What you say to yourself and how your body reacts when you are finding something hard is important in taking steps towards learning
* We need to look after our brain as we do any other part of our body

**Top tip!**

Display quotes from successful people or cartoon characters in the classroom that convey growth and fixed mindsets.

**Discussion points**

* What goals can I set for myself?
* How can I be sensitive to both my needs and those of others as we work toward strengthening our brains?
* How can I remain patient with myself as I make mistakes that contribute to my brain’s growth?
* How can I best handle unfamiliar new experiences?
* Do I fall into any negative thinking traps and what are better ways to manage difficulties.

**Suggested activities**

* Adapt fixed mindset phrases into growth mindset phrases (appendix 5)
* Create posters to display the value of having a growth mindset
* Practice positive self-talk- make posters (red and green thoughts) e.g. ‘I’m not quite there yet’ vs ‘I’m rubbish at Maths’
* Explore what we need to do to keep our brains healthy- oxygen, healthy eating, relaxation etc.
* Explore basic relaxation/mindfulness exercises and the importance of breathing
* Marshmallow experiment- demonstrate the importance of controlling impulses in relation to learning. Emphasise that we can practice this skill
* Video- the Power of Yet <https://www.youtube.com/watch?v=XLeUvZvuvAs>
* Make links with famous people who demonstrate fixed or growth Mindset. There are lots of quotes- try Michael Jordan or Homer Simpson ‘trying is the first step towards failure’

Plenary

**Suggested activities**

* Review the questions that have been generated by the class
* Allow the class to present what they have learned to another class or at assembly or by creating a booklet, poster or Powerpoint presentation
* Invite parents to hear pupils talk about what they have learned

**Embedding and sustaining a Growth Mindset approach to learning**

* introduce a weekly learning reflection tool
* Incorporate a Growth Mindset feedback tool into your classroom practice: <http://www.mindsetworks.com/websitemedia/resources/growth-mindset-feedback-tool.pdf>
* Introduce a ‘mistake log’ to normalise the process of noticing mistakes and to explore the learning that has taken place
* Use a mastery approach to praise focussing on rapid, high quality feedback