Mapping of fruit fly brain to change neuroscience

7th October 2024

Scientists have created a map of the wiring of a fruit fly's brain in a research project called FlyWire. The map of the neurons and connections is the most detailed ever produced for a creature. This groundbreaking feat could revolutionize the field of neuroscience and unlock secrets about our own brain. Brain specialist Dr Gregory Jefferis told the BBC: "The mapping of the fly brain is really remarkable and will help us get a real grasp of how our own brains work." He said it could provide insights into "the mechanism of thought". It took scientists years to analyze the fly's pinhead-sized brain. They created a detailed diagram of 139,255 neurons and 50 million connections.

The diagram of the fly's brain's neural pathways looks like a scientific work of art. It is a stunning, colourful web of neurons. The diagram is known as a connectome. To create it, the scientists sliced the fruit fly brain into 7,000 microscopic slivers. Each of these was studied using an electron microscope that imaged cells that were four-millionths of a millimetre wide. The researchers classified more than 8,400 different cell types. If the neural pathways were unravelled, they would stretch for 150 metres. The human brain has 86 billion neurons and trillions of connections. Current technology could not create a connectome of our brain. That map is still decades away.

Sources: bbc.com / *nature.com* / *theguardian.com*

Writing

Research into a fruit fly's brain is essential. Discuss.

Chat

Talk about these words from the article.

scientists / map / fruit fly / neurons / neuroscience / secrets / specialists / the brain / diagram / work of art / microscopic / cells / connection / current technology

True / False

1) The name of the research project is Wire Fly. T / F
2) The map of the fruit fly brain is the most detailed done for any animal. T / F
3) A brain expert believes the map will help us understand human thought. T / F
4) The map shows 50 million neural connections in a fruit fly's brain. T / F
5) The brain map has been turned into a piece of art. T / F
6) Scientists analyzed 7,000 tiny specimens of a fruit fly's brain. T / F
7) The pathways in the fruit fly brain would stretch for 150 metres. T / F
8) A map of the human brain will be available by the end of the decade. T / F

Synonym Match

(The words in **bold** are from the news article.)

1.	**connections**	a.	categorized
2.	**creature**	b.	workings
3.	**remarkable**	c.	network
4.	**mechanism**	d.	extend
5.	**diagram**	e.	interrelationships
6.	**web**	f.	outline
7.	**classified**	g.	present-day
8.	**unravelled**	h.	animal
9.	**stretch**	i.	untangled
10.	**current**	j.	exceptional

Discussion – Student A

a) What do you think about what you read?
b) What do you know about neuroscience?
c) How important is neuroscience?
d) Would you like a connectome for your brain?
e) How would it be to be able to communicate with insects?
f) How useful would a map of the human brain be?
g) What are your favourite insects?
h) What questions would you like to ask the researchers?

Phrase Match

1.	This groundbreaking	a.	of neuroscience
2.	revolutionize the field	b.	of 139,255 neurons
3.	help us get a real	c.	unravelled
4.	analyze the fly's pinhead-	d.	away
5.	They created a detailed diagram	e.	grasp of how
6.	like a scientific work	f.	feat
7.	scientists sliced the fruit fly brain into	g.	of connections
8.	If the neural pathways were	h.	of art
9.	trillions	i.	sized brain
10.	That map is still decades	j.	7,000 microscopic slivers

Discussion – Student B

a) What do you know about fruit flies?

b) How useful is a map of a fruit fly's brain?

c) What secrets are there about our brain?

d) What can we do to look after our brain?

e) What would happen if a machine could read our thoughts?

f) What would you like to know about the brain?

g) What might fruit flies think about?

h) What would you think if scientists could programme our brain?

Spelling

1. The map of the eurnnos
2. groundbreaking efat
3. the field of surneeicnoce
4. He said it could provide niihgsts
5. the cmnahiesm of thought
6. a atdieeld diagram
7. The diagram is known as a enncootcme
8. 7,000 csrocmpoiic slivers
9. using an lectreon microscope
10. The researchers lascfisied more than 8,400
11. If the neural pathways were nrvulealed
12. That map is still eacddes away

Answers – Synonym Match

1. e	2. h	3. j	4. b	5. f
6. c	7. a	8. i	9. d	10. g

Role Play

Role A – Fruit Flies

You think fruit flies are the best flies. Tell the others three reasons why. Tell them what is wrong with their flies. Also, tell the others which is the worst of these (and why): dragonflies, fireflies or crane flies.

Role B – Dragonflies

You think dragonflies are the best flies. Tell the others three reasons why. Tell them what is wrong with their flies. Also, tell the others which is the worst of these (and why): fruit flies, fireflies or crane flies.

Role C – Fireflies

You think fireflies are the best flies. Tell the others three reasons why. Tell them what is wrong with their flies. Also, tell the others which is the worst of these (and why): dragonflies, fruit flies or crane flies.

Role D – Crane Flies

You think crane flies are the best flies. Tell the others three reasons why. Tell them what is wrong with their flies. Also, tell the others which is the worst of these (and why): dragonflies, fireflies or fruit flies.

Speaking – Flies

Rank these with your partner. Put the best at the top. Change partners often and share your rankings.

- Fruit flies
- Dragonflies
- Fireflies
- House flies
- Crane flies
- Gauromydas
- Mosquitoes
- Hoverflies

Answers – True False

1	F	2	T	3	T	4	T	5	F	6	T	7	T	8	F

Answers to Phrase Match and Spelling are in the text.

