

Making Sense of SCIENCE

Genes & Traits: Student Work Samples & Task A for Grades 5-12

Kirsten R. Daehler and Jennifer Folsom

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Making Sense of SCIENCE

GENES & TRAITS

STUDENT WORK SAMPLES & TASK – SET

Introduction to the Student Work Samples

Students completed this “Discussing DNA” task as a near end-of-unit check of how they were thinking about genetics. Before doing this task, the 8th graders investigated the structure of DNA and RNA, DNA replication, transcription, translation, and the many ways cells regulate the expression of their genes. To complete this task, students worked individually and did *not* have their notebooks, but posters the teacher presented during the unit and posters that students created during the unit were displayed around the room.

This student work was collected for educators to use for their own professional learning. It is ideal to use with our Making Sense of Student Work protocol when teachers are unable to bring in student work from their classrooms. It can also be used with many other protocols designed to support teachers looking collaboratively at student work.

The samples in this download include ones from students with high, medium, and low levels of understanding. They show an authentic variety

of responses from a typical classroom. To protect students’ identities, their names have been removed and each has been assigned an alias.

Also included in this PDF is a black line master of the task. This task is part of a larger Formative Assessment Task Bank. The full task bank and other task banks on different topics are available for download. Visit our website for more information and to purchase these items.

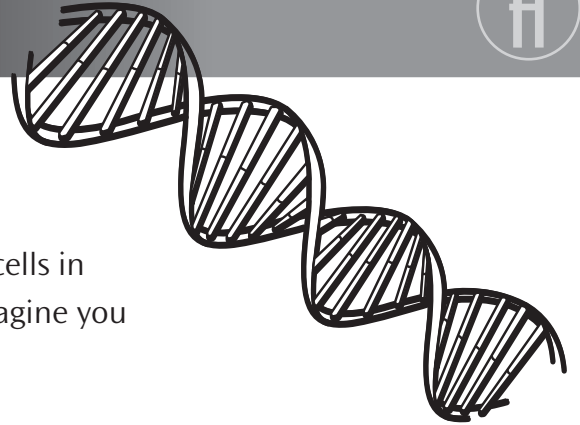
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Name: _____

DISCUSSING DNA

TASK



José and Amanda are discussing why different types of cells in their bodies have different structures and functions. Imagine you joined their discussion. What would you say?

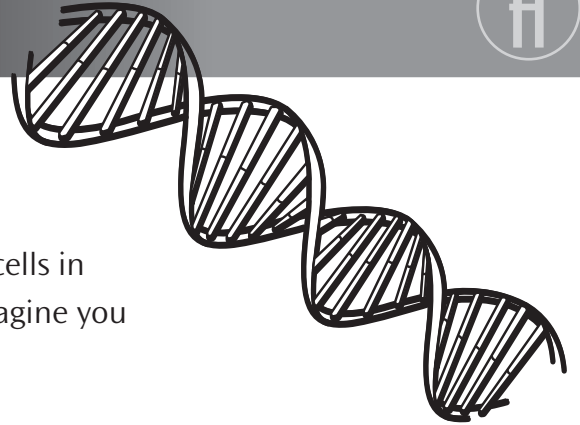
I think all my cells have the same DNA and make the same proteins. Different cells just do different stuff with the proteins they make.

José says...

I disagree. I think different cells have different DNA. They only have the sections they need. That's why your cells have different traits.

Amanda says...

DISCUSSING DNA



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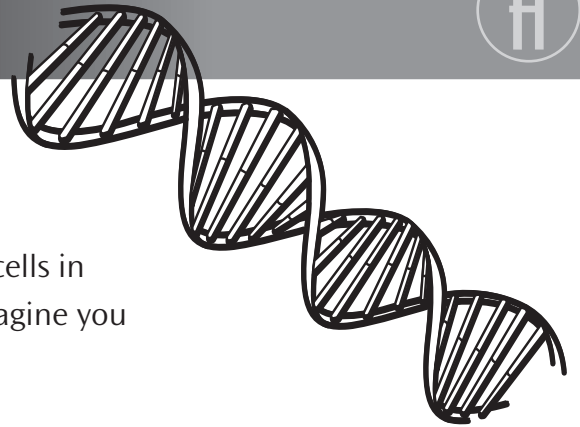
José says...

I disagree. I think different cells have different DNA. They only have the sections they need. That's why your cells have different traits.

Amanda says...

I disagree with both. It is true that all cells have the same DNA, however, different types of cells turn on and off different sets of genes. This allows them to make different types of proteins that gives them different types of structures and functions.

DISCUSSING DNA



José and Amanda are discussing why different types of cells in their bodies have different structures and functions. Imagine you joined their discussion. What would you say?

I think all my cells have the same DNA and make the same proteins. Different cells just do different stuff with the proteins they make.

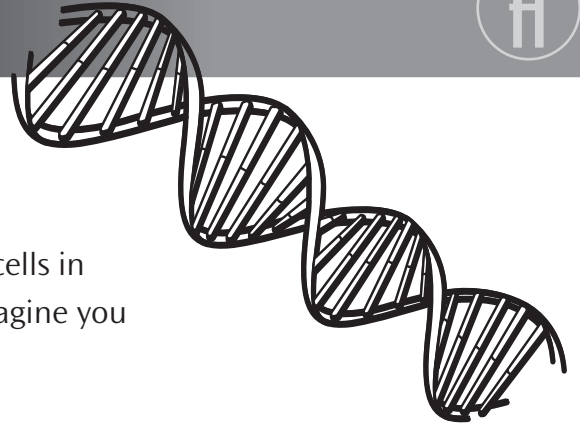
José says...

I disagree. I think different cells have different DNA. They only have the sections they need. That's why your cells have different traits.

Amanda says...

I agree with José that all cells in a person have the same DNA. When ~~the~~ a new cell is formed, DNA is copied, so that the cells' DNA remain mostly the same. Some variations may be caused by mistakes while copying the DNA, but the main reason why the cells do different things is because the cells' surroundings and reactions because of their environment.

DISCUSSING DNA



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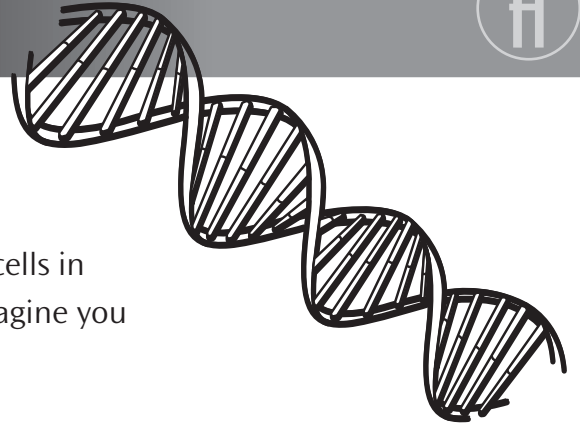
José says...

I disagree. I think different cells have different DNA. They only have the sections they need. That's why your cells have different traits.

Amanda says...

I think all cells have the same DNA. Different chemical signals tell cells which parts of the DNA to use. Some DNA is activated and tells the cell what structures and proteins to make and how to respond to different messages.

DISCUSSING DNA



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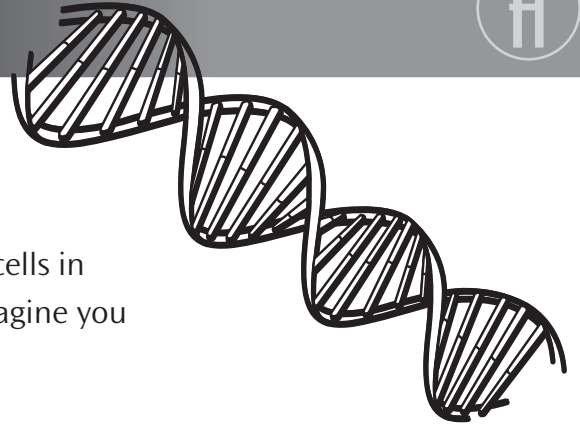
José says...

I disagree. I think different cells have different DNA. They only have the sections they need. That's why your cells have different traits.

Amanda says...

All my cells do have the same genetic code. Each cell just has a different function. If you took my blood & skin cells the genetic DNA would be the same.

DISCUSSING DNA



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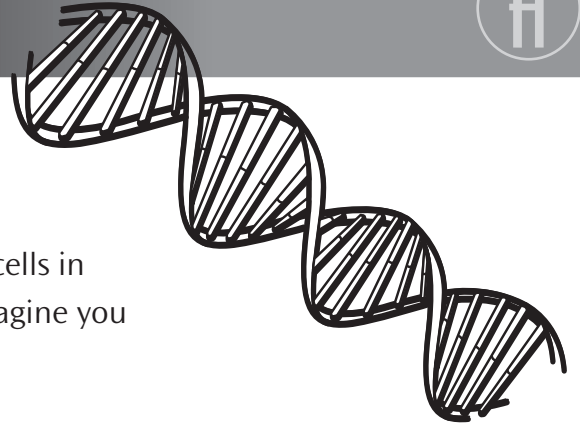
José says...

I disagree. I think different cells have different DNA. They only have the sections they need. That's why your cells have different traits.

Amanda says...

I think that cells all have the same DNA, just different parts are more prominent in different cells. They also make different proteins for different functions.

DISCUSSING DNA



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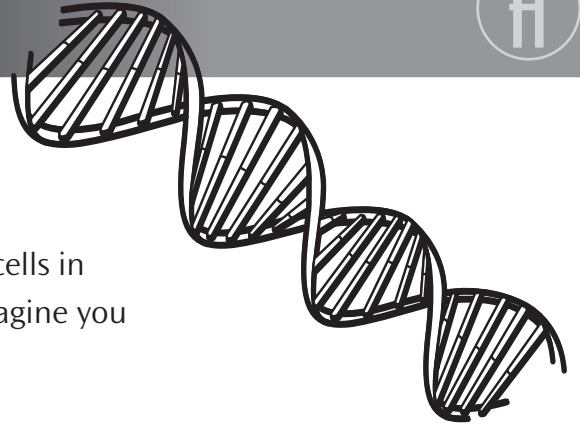
José says...

I disagree. I think different cells have different DNA. They only have the sections they need. That's why your cells have different traits.

Amanda says...

All cells have the same DNA, but only pay attention to certain sections that dictate the cell's function. This is because all cells are come from the original cell. The first cell copy's its DNA and splits, etc. Ultimately creating an ~~org~~ multicelled organism with the same DNA.

DISCUSSING DNA



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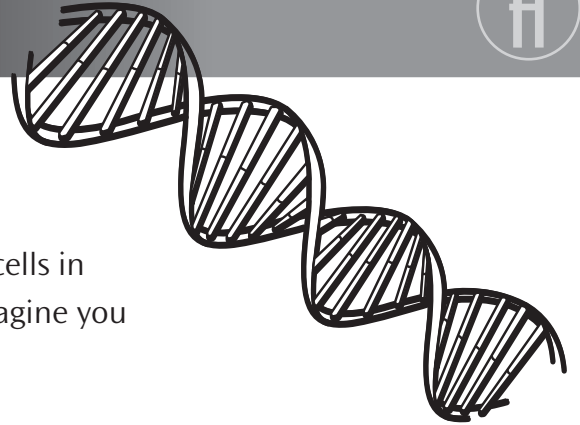
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I disagree. I think different cells have different DNA. They only have the sections they need. That's why your cells have different traits.

Amanda says...

When cells are created in a human fetus, they're called stem cells. Cells that can become anything. All cells have the same DNA, the difference is ~~the~~ which DNA they act on. Once a chemical indicator tells them to do something, they act on it and change into their cell.

DISCUSSING DNA



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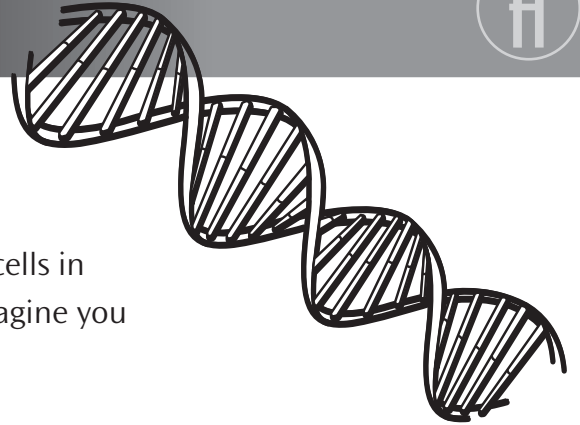
José says...

I disagree. I think different cells have different DNA. They only have the sections they need. That's why your cells have different traits.

Amanda says...

I disagree. I think that each cell has ~~different~~ ~~the~~ the same DNA, but they only use/turn on the DNA that they need to use/operate. Every cell has exactly the same type of DNA, but some parts are wrapped tighter and they are not used. The ones that are wrapped looser are the ones that are turned on.

DISCUSSING DNA



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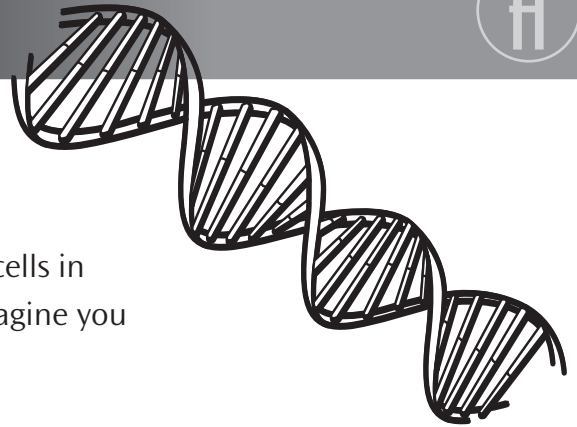
José says...

I disagree. I think different cells have different DNA. They only have the sections they need. That's why your cells have different traits.

Amanda says...

I agree with Amanda, because different cells have different sets of DNA. The DNA is the coding for the work. Since ~~diff~~ there are multiple functions in the body, different cells are coded differently to operate. In conclusion, different cells have different DNA.

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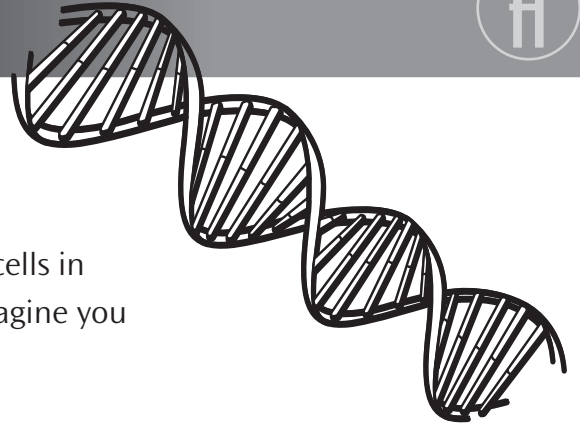
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Amanda says...

I agree with Amanda in that different cells have different DNA - that's what makes them perform different functions. I do believe that cells that all serve one main purpose (ex. red blood cells, platelets, etc.) have largely the same DNA, if not exactly the same, but that the DNA does differ for different tasks the cells perform.

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Amanda says...

Both of them are right, to a degree. Amanda's saying is right in most cases, I believe. I am assuming ~~the~~ evolution has been smart enough to only make cells that have only the DNA needed for their function. However, stem cells, which can "evolve" into other cells for other functions (when time requires so), have to contain all the DNA for their ability to perform random tasks amongst the body.