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9th/10th Grade Biology
Biology Lesson Plan: Feelin' It: The Impulse
S ED 720
Dr. Jamal Cooks

Feelin' It: The Impulse

Objective: Students will be able to demonstrate their understanding of the central role of the stimulus impulse in the reception of sensory stimuli and in the direction of voluntary muscle movements.

Instructional Materials:

Teacher brings:

1. Laptop computer w/ LCD projector
2. DVD w/ the following links on it:
 - a. <http://www.milkandcookies.com/links/25187/>
 - b. <http://www.milkandcookies.com/links/13782/>
 - c. <http://www.ne-o.co.uk/fshock.html>
3. 12 Slinky toys
4. CD player
5. CD: LL Cool J's "All World", featuring single "Goin' Back to Cali"

Students bring:

1. Classroom writing journals
2. A pencil

Special Considerations:

1. This lesson is supposed to be fun (i.e., more fun than usual), because it begins a new unit on the nervous system, and it is especially important to have students be "into it."
2. There is a fair amount of movement in this lesson, with the Slinky toys exercise, so it might be good to establish a seating pattern in the beginning of class that creates a lot of space in the middle of the room.
3. Breakdancing scenes may lead some students to show off their skills in class, which would be fun, but should not be allowed to take over the class.
4. Make sure that students don't twist & tangle up the Slinkys.

Procedures:

Time (min.)	Teacher	Students	Learning/literacy Strategies/modalities addressed
4	Take Attendance while students do the "DO NOW" exercise: "Clap your hands together 3x. After you have finished, open your classroom writing journal and try to explain how you know	Clap 3x, then write down their observations	Kinesthetic learners allowed a chance to think about the physical processes of

	<p>that you successfully clapped your hands together. What senses did you use to figure it out?</p> <p>Written on the board are vocabulary words: Nervous System; Stimulus; Impulse; Sensory Nerves; Motor Nerves</p>	<p>and thoughts in their journals.</p>	<p>nervous sensation.</p> <p>Vocabulary words on the board helps ELL students & others focus on key concepts addressed in class</p>
1	<p>Gather quick responses from students: What senses did you use? If necessary, guide them to observe that they used hearing (auditory), sight (visual), and touch (tactile) senses to know when they had succeeded in clapping.</p>	<p>Respond orally</p>	<p>Oral literacy.</p>
2	<p>Teacher instructs students to write in journal, “What is the common thread throughout the video clips?” Then, teacher tells students that they will be watching several dance video clips, and they are expected to compare the clips to determine what is similar across all the clips.</p>	<p>Record prompt in writing journals, and prepare to observe the videos</p>	<p>“Pre-reading” the video clips (or preparing the students to actively watch them) prepares students to focus on their observation skills.</p>
6	<p>Teacher shows clips of breakdancers doing the wave (in various different forms).</p> <p>a. http://www.milkandcookies.com/links/25187/ b. http://www.milkandcookies.com/links/13782/ c. http://www.ne-o.co.uk/fshock.html</p>	<p>Watch videos and compare content to discover common elements. Then write responses in journal</p>	<p>Visual modalities engaged, as students use videos to build a concept of the stimulus as a wave passing through the body.</p>
2	<p>Gather quick responses from students: what did they observe? Guide them to the idea of the wave passing through people’s bodies.</p>	<p>Respond orally</p>	<p>Students increase literacy skills by recording ideas in writing, and by expressing them orally.</p>
15	<p>Direct Instruction: Use overhead projector transparencies. Nervous system introduced as system of nerve cells throughout the body that pass messages around the body in wave-like messages called “impulses”. Nervous system includes nerve cells (neurons), nerves, spinal cord, and brain. Indicate that over the course of this unit, all of these parts will receive attention.</p> <p>Some nerves (sensory nerves) send messages</p>	<p>Listen, take notes, copy drawings off overhead</p>	<p>Auditory/symbolic learners benefit from direct instruction, and teacher gets to present overview, as well as correct misconceptions students may have. Visual learners get</p>

	<p>to the brain from the body, nose, eyes, ears, mouth. These messages are begun by what are called “stimuli”. Define stimulus as anything that causes a sensory nerve to initiate impulse.</p> <p>Moving in the other direction, some nerves (motor nerves) send messages from the brain to the muscles of the body. Both kinds of nerves (sensory & motor) are necessary for the normal functioning of the total system.</p> <p>Brain is the center of the system; other nerves around the body feed information to, and receive orders from, the brain</p>		<p>illustrations of impulses traveling through the nervous system.</p>
2	<p>Teacher explains in-class writing assignment: “Focusing only on the tactile (touch) sense, please describe every stimulus your nervous system is processing as you’re writing this answer.”</p>	<p>Students listen to directions</p>	
2	<p>Teacher monitors student responses, answers any questions</p>	<p>Students write responses in journal</p>	
3	<p>Teacher instructs students to break into pairs, and distributes a Slinky toy to each pair, and tells them each to hold an end and move roughly 10 feet apart, so that the slinky is fairly taut.</p>	<p>Students follow directions</p>	
2	<p>Teacher explains that the Slinky is like a nerve, and shows students how they can create their own wave impulses with the Slinky</p>	<p>Students practice making their own impulses move in a wave along the Slinky</p>	<p>Visual & kinesthetic learners getting a feel for a impulse wave.</p>
3	<p>Teacher breaks pairs into 3 groups: Group 1 is the bass group: when they hear a bass drum, they make an impulse; Group 2 is the verb group: when they hear a verb, they make an impulse; Group 3 is the Cali group: when they hear “Cali”, they make an impulse. Whenever anybody makes an impulse, they quietly say, “Impulse”.</p>	<p>Students break into groups and get ready</p>	
4	<p>Teacher plays “Goin’ Back to Cali” by L.L.</p>	<p>Students make their own impulses.</p>	<p>Visual & kinesthetic learners getting a feel for a impulse wave. Auditory learners hear “impulse” every time an impulse is created.</p>

3	Writing prompt for journal end-of-class assignment: “Thinking about what we just did, try to explain what were the stimuli, what was the nerve, and what was the impulse? Please write using complete sentences.”	Students think and write answers in journal	
3	Review of what exercise intended to show: stimuli (bass drum, verbs, and “Cali”) caused a nerve to fire, causing an impulse to move along the nerve from one end to the other.	Students respond orally.	
2	Teacher instructs students to revise their journals, if necessary	Students revise earlier responses, if necessary	
2	Teacher explains homework assignment	Students listen	

Sample Student Products: As a result of this lesson, students will produce:

1. In-class written assignment: Write a short paragraph responding to the following prompt: “Focusing only on the tactile (touch) sense, please describe every stimulus your nervous system is processing as you’re writing this answer.”
2. Homework assignments:
 - A. 5 points: Think about how many stimuli you identified in the in-class writing assignment. Now, consider all 5 senses. Write down at least 10 stimuli for each of the 5 senses that you personally experienced today
 - B. 10 points: Write down 5 stimuli (from any sense) that you would rather not experience again, as well as 10 stimuli that you would like to be a part of your daily experiences, and why.

Assessment: Journal responses are monitored, and checked for appropriateness in-class; more thorough inspection of responses takes place during periodic binder checks.

The end-of-class written assignment can receive a maximum of 10 points, broken down as follows:

- ❑ 6 points for identifying stimulus, nerve, and impulse correctly.
- ❑ 2 points for coherently explaining how the above elements are functionally connected.
- ❑ 2 points for using complete sentences throughout.

The homework assignment can receive a maximum of 15 points, broken down as follows:

- ❑ 5 points for Part A: identifying 10 stimuli per sense (1 point apiece for each sense).
- ❑ 10 points for Part B: Full credit is given to a thoughtful response with details both about the negative stimuli (opinions about what stimuli that they experience every day are unpleasant) and the positive ones (what would they like to be a part of their everyday lives).

Reflections: I expect this to be a fun class, with many different modalities engaged, and a lot of energy. While there are many transitions, most seem fairly manageable without an inordinate amount of management expertise.

Also, it will be important to acknowledge the profanity in the Eminem lyrics, to make sure that students are prepared for them, and don't focus on these lyrics at the expense of the key ideas relevant to the lesson.

Literacy Aspect: There are several different forms of literacy addressed in different facets of this lesson:

1. Written literacy skills. Students will practice their writing skills in two key areas:
 - a. Factual writing. As students record detailed, written observations in their classroom journals, they exercise factual writing/observation skills, which are critically important in science.
 - b. Comparative writing: Students will record their thoughts regarding comparing common elements among the videos. Should help compare/contrast essays.
 - c. Expressive writing. As students work through their homework writing assignments, they are required to exercise their ability to write expressively about their own experiences: in this exercise, students are required to identify aspects of their environment that they feel strongly about. In addition, the assignment requires that students exercise imagination and conjure up things that they would prefer to experience every day, and express this in writing, which for many of us poses an expressive challenge.
2. Oral literacy skills. Students will practice their oral literacy skills by sharing their own observations and conclusions with the class.
3. Scientific method literacy skills. Science in some ways has its own language and discourse, requiring different literacy skills, in part centered around the scientific method (including forming hypotheses, performing well-designed experiments, observing results accurately, reaching conclusions). In this class lesson, students are repeatedly required to practice all of these skills.

From:

http://www.ohhla.com/anonymous/eminem/rm_bside/yourself.mnm.txt

[Intro]

Look.. if you had.. one shot, or one opportunity
To seize everything you ever wanted.. in one moment
Would you capture it.. or just let it slip? Yo..

[Verse 1]

His palms are sweaty, knees weak, arms are heavy
There's vomit on his sweater already, mom's spaghetti
He's nervous, but on the surface he looks calm and ready
to drops bombs, but he keeps on forgetting
what he wrote down, the whole crowd goes so loud
He opens his mouth but the words won't come out
He's chokin, how? Everybody's jokin now
The clock's run out, time's up, over - BLAOW!
Snap back to reality, OHH - there goes gravity
OHH - there goes Rabbit, he choked
He's so mad, but he won't
Give up that easy nope, he won't have it
He knows, his whole back's to these ropes
It don't matter, he's dope
He knows that, but he's broke
He's so sad that he knows
when he goes back to this mobile home, that's when it's
back to the lab again, yo, this whole rap shit
He better go capture this moment and hope it don't pass
him

[Chorus]

You better - lose yourself in the music, the moment
You own it, you better never let it go (go)
You only get one shot, do not miss your chance to blow
This opportunity comes once in a lifetime
You better - lose yourself in the music, the moment
You own it, you better never let it go (go)
You only get one shot, do not miss your chance to blow
This opportunity comes once in a lifetime
You better..

[Verse 2]

Soul's escaping, through this hole that is gaping
This world is mine for the taking
Make me king, as we move toward a, new world order
A normal life is boring; but superstardom's
close to post-mortem, it only grows harder
Homie grows hotter, he blows it's all over
These hoes is all on him, coast to coast shows
He's known as the Globetrotter
Lonely roads, God only knows
He's grown farther from home, he's no father
He goes home and barely knows his own daughter
But hold your nose cause here goes the cold water

These hoes don't want him no mo', he's cold product
They moved on to the next schmoie who flows
He nose-dove and sold nada, and so the soap opera
is told, it unfolds, I suppose it's old partner
But the beat goes on da-da-dum da-dum da-dah

[Chorus]

[Verse 3]

No more games, I'ma change what you call rage
Tear this motherfuckin roof off like two dogs caged
I was playin in the beginning, the mood all changed
I've been chewed up and spit out and booed off stage
But I kept rhymin and stepped right in the next cypher
Best believe somebody's payin the pied piper
All the pain inside amplified by the
fact that I can't get by with my nine to
five and I can't provide the right type of
life for my family, cause man, these God damn
food stamps don't buy diapers, and there's no movie
There's no Mekhi Phifer, this is my life
And these times are so hard, and it's gettin even harder
Tryin to feed and water my seed plus, teeter-totter
Caught up between bein a father and a primadonna
Baby momma drama screamin on her too much for me
to wanna
stay in one spot, another day of monotony
has gotten me to the point, I'm like a snail I've got
to formulate a plot, or end up in jail or shot
Success is my only motherfuckin option, failure's not
Mom I love you but this trailer's got to go
I cannot grow old in Salem's Lot
So here I go it's my shot, feet fail me not
This may be the only opportunity that I got

[Chorus]

[Outro]

You can do anything you set your mind to, man