



Purpose:

Science reading during class or as a homework assignment is integral to learning. Such reading can take the form of textbook reading or scientific articles that a teacher might choose to share with the class. Reading activities or assignments will help explain a new topic, enrich student's prior knowledge, or present a topic from a different perspective.

Teachers must consider the variety of student reading skills and abilities when assigning a reading article or passage. However, there are a few aspects which all science teachers should consider when assigning reading:

- Assess the reading level of the text to be assigned. Is it too difficult? Is the text accessible to all students in class?
- Assuming the reading was worth assigning, the teacher should ensure that all students will be able to comprehend the text.
- Always identify the purpose of the reading to the students. Teachers should explain to the students why the assignment was given and the instructional value in the assignment. Being upfront with the students about value, difficulty and purpose helps the students tackle reading difficulties. For example:
 - a. share what students should know after reading
 - b. anticipate difficulty
 - c. model how to negotiate difficulty by thinking aloud
 - d. explain what you want them to be able to do with the information they read
 - e. encourage students to mark/annotate the text on handouts or use sticky notes
- When a student is given something to look for in the reading, the reading feels less overwhelming
- Share with students any difficulties you had with reading and how you overcame them.

Description of Activity:

Similar to many other activities and assignments, reading activities will require careful planning and preparation. The attached sample of a reading activity is from a Biology human anatomy class. At the time of the assignment, students are learning about muscles. The article is about the use of steroids, their effect on the body and the problems associated with taking steroids. The article is easy to read, relevant, and interesting despite having some difficult vocabulary words.

Prior to handing out the article, students are asked to complete the Knowledge Rating activity, which assesses student's prior knowledge of the vocabulary words contained in the article. As part of the homework assignment, students are asked to look up the meanings of any words or phrases they do not understand.

The next day, the teacher would discuss the meaning of difficult vocabulary words and phrases. Armed with this newly acquired knowledge, students are asked to read the article for homework. As they read, students are encouraged to annotate, underline, make comments in the margin, and write questions. The page of comprehension questions associated with the reading could also be assigned for homework that night.

Students in a 4 level biology class should have no problem reading the article and answering the questions in one evening. A 2 level class would divide the assignment into 1). reading and annotating 2). discuss the article and annotations 3). comprehension questions. Especially in the beginning of the school year, teachers should model the reading and annotating with the students. Although an article on Steroids would elicit interesting class discussions, the teacher should also ensure students have read the article and performed the proper annotations. The comments made in the class discussion should not take precedent over the skill building of reading, annotating, and reflective thinking.

Attached are copies of:

1. The Knowledge Rating of the words and phrases used in the Steroid article.
2. The Steroid article.
3. A copy of an annotated Steroid article.
4. The questions related to the Steroid article.

Checking for Understanding:

During the class discussion, the teacher will have a good sense of how the students feel about the article. At the same time, by collecting and grading the questions, the teacher will be able to judge the level of student comprehension. Because students will know the difficult vocabulary words prior to reading the article, students should really grasp and enjoy the reading and understand the facts presented.

Reflection:

The steroid article is an excellent example of scientific literature that can be interesting and relevant to a teenager's life. Although finding these articles are not difficult, developing the purpose, comprehension questions, and reading skills necessary can be challenging. Motivating students to read non-fiction in science can make their science class more tangible and relevant to everyday life.

Adaptation for Different Levels:

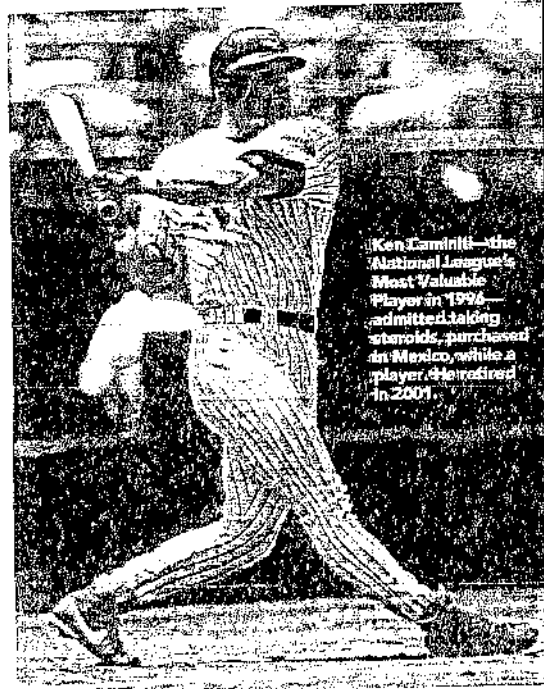
Students taking 4 level science classes are often in 3 or 4 level English. All 2 level science classes and many 9 level biology and geoscience classes have students taking 2 level English. Thus, the reading and vocabulary skills of science students in the different levels vary greatly. Most students taking 4 level classes are adequate to good readers who will not require as much reading instruction. Science teachers teaching 2, 3 or 9 level classes will spend different amounts of time engaging the students in the reading activity, going over possible new vocabulary, and describing strategies for tackling complicated or difficult readings. Science teachers should take the time to find out in which English classes their students are enrolled.

Name: _____

Knowledge Rating:
Big Muscles, Bigger Problems

Vocab Word/ Concept	Never heard of it	Heard of it, can't tell meaning	Vague understanding	Know meaning
Anabolic				
Steroids				
Stamina				
'Street drugs'				
Synthetic				
Derivatives				
Hormone				
Androgenic				
Libido				
Rx				
Stunted				
Impotence				

Vocab Word/ Concept	Never heard of it	Heard of it, can't tell meaning	Vague understanding	Know meaning
Menopausal				
Orally				
Topically				
Illicit				
Pig in a poke				
Supplements				
Contraband				
Synthetic				
Precursor				
Panoply				
Physical				
Psychological				
Estrogen				
Abstainer				



Ken Caminiti—the National League's Most Valuable Player in 1996—admitted taking steroids, purchased in Mexico, while a player. He retired in 2001.

Anabolic steroids have medically sanctioned uses, but bulking up is not one of them. The uncontrolled use of steroids is damaging to men, women and teenagers. Here's what you should know.

Big Muscles, Bigger Problems

By Dr. Isadore Rosenfeld

THERE HAS BEEN A GREAT deal of publicity recently about the use of anabolic steroids by athletes and its impact on "the game." However, these substances also are being taken by up to a million nonprofessional athletes—teens and adults of both sexes eager to improve their appearance, strength, stamina and physical performance.

How do anabolic steroids work? When are they legal, and when are they "street drugs"? More important, is there a downside to using them?

Anabolic steroids are naturally occurring or synthetic derivatives that eventually are converted into the male hormone testosterone, most of which is produced by the testes. Testosterone has two main actions—*androgenic* and *anabolic*. The androgenic effects "make" a man—the pitch of his voice, his hair distribution, libido, bone structure and body build—first in puberty and ultimately as an adult.

The anabolic (from the Greek word meaning "to build up") effect is to convert food—mostly protein—into muscle mass. It's the anabolic action rather than the androgenic that's the real root of steroids' popularity with athletes and devotees of physical fitness.

A legal Rx for testosterone. Without a prescription, you can't legally obtain testosterone or an anabolic steroid. Both of these substances are primarily intended to treat males whose testes aren't

making enough hormone. This deficiency results in stunted growth, delayed puberty, impotence, infertility or the wasting away of body tissues in such chronic diseases as AIDS. Some menopausal women also may take steroids for osteoporosis or to increase sexual desire. Most doctors won't prescribe them for athletic or bodybuilding purposes.

Anabolic steroids are taken orally, by injection or nasal spray, or are applied topically. The oral form can hurt the liver, and injections are fraught with potentially serious complications.

Even prescribed doses of steroids have side effects. Imagine what huge amounts can do.



A healthy man produces less than 10mg of testosterone daily. The dosage prescribed depends on the condition being treated. Those who use steroids illegally often take *hundreds* of milligrams, either of a single preparation or a combination of several different ones (known as "stacking") to obtain the desired effect. Imagine what these huge amounts can do when even prescribed doses can cause side effects!

"Street" steroids. Without a doctor's pre-

scription, people often obtain anabolic steroids either on the Web or from an illicit source. Some of these products are made in this country and illegally diverted; others are smuggled in from abroad. In either event, you're buying a pig in a poke. Of course, the FDA does not oversee the manufacture of supplements or contraband, and the listed contents of street drugs may bear no relation to what's actually in the bottle. Whether it's in pill or injectable form, the product may contain much more steroid than what's claimed or even none at all.

Most anabolic steroids, especially the synthetic ones, can be detected in the blood and urine. However, some products being sold as "supplements" are specifically designed to defy such detection.

The steroid precursor Andro (androstenedione) was once readily available in health food stores and widely used to enhance performance by such athletes as Mark McGwire. However, the FDA recently cracked down on its sale. Although Andro is technically not a steroid, it acts like one.

The hazards of uncontrolled steroid use. Anabolic steroids can cause a panoply of side effects, both physical and psychological. Their adverse effects can appear soon after you begin to take them, or they may be delayed.

Although this toxicity can affect any organ system, it's the androgenic aspects that are the most

continued

apparent and important for long-term abusers of steroids. Oddly, men may become more like women and vice versa. Here's why it happens:

Feminized men. When a man takes large amounts of testosterone or anabolic steroids for a prolonged period, some is converted into female hormone (estrogen). This is in addition to the small amounts of estrogen normally present (each of the sexes has some of the other's hormones). While you're taking steroid supplements, your testes—which normally make testosterone—become lazy and quit. After all, why should they bother to produce the hormone when you're doing the job


for them with your pills and injections? So these now-dormant glands shrink and eventually lose their ability to make the male hormone. Sperm count is reduced, and you can become infertile. Then, when you quit providing the outside source and have to depend on your own production of testosterone, your body isn't making it. So what you have on board is mostly estrogen.

The male would-be bodybuilder or athlete may then develop enlarged breasts (gynecomastia), female distribution of fatty deposits, and soft muscles. Gynecomastia is permanent; other changes may not be.

Masculinized women. In women, the

If steroids truly improve strength and endurance, how can you compare the performances of athletes?

The effect on sports. There is no proof that anabolic steroids really enhance agility, skill, cardiovascular capacity or overall athletic performance. But most athletes and their trainers think they do significantly increase muscle mass, strength and endurance. If that's true, how can you compare performances among athletes? How can you tell when a world record set by an "abstainer" has been broken by a "steroid junkie"? That's why the International Olympic Committee has banned the use of more than 40 anabolic steroids.

Even though some men and women do tolerate steroids, and some toxicity is reversible, overall the benefits are not worth the risk, in my opinion. There's enough illness in the world without looking for more trouble. These drugs can ruin you *and* the sport in which you are trying to excel. 

Are These Risks Worth It?

Besides changes in sexual characteristics, side effects from the long-term use of anabolic steroids in both sexes at all ages include:

Bloated appearance	High cholesterol
Weight gain	Weak tendons
Blood-clotting disorders	Elevated blood pressure
Liver damage (especially from the pills)	Addiction/dependence
Premature heart attacks and strokes	Acne
	Kidney problems
	Aggressive behavior ("roid rage")

net increase of testosterone from anabolic steroids can result in masculinization by suppressing estrogen production. This means excessive growth of body hair in the wrong places, loss of hair (alopecia) and menstrual abnormalities. Fortunately, many of these complications are reversible over time.

Thinner, tormented teens. Adolescents who use steroids (many of them 10th- to 12th-graders) have problems of their own. These include premature closure of the growth centers in their bones, leaving them shorter than their peers. That's bad enough, but the major problems these kids have are behavioral. Some become bipolar or depressed, aggressive and addicted to steroids in much the same way they can get hooked on amphetamines (speed).

What's more, injecting steroids with shared needles also risks exposure to AIDS or hepatitis.

Little bit of steroids (attached) to their weightlifters! Here's what you should know!

By Dr. Isadore Rosenfeld

Biggest Problems

Get the full story on the steroid epidemic in the United States. How it's affecting the young men and women who are lifting weights. How to recognize the signs and symptoms of steroid abuse. How to help your child or friend who is abusing steroids. How to help your child or friend who is recovering from steroid abuse. How to help your child or friend who is recovering from steroid abuse.

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Legal use

→ Illegal

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for women

enagers

athletes

Big Muscles, Bigger Problems | continued

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Name: _____

Big Muscles, Bigger Problems

1. Why would a male be given a prescription for testosterone? Give examples of the results of a lack of this hormone.
2. List 2 disadvantages of using “street” steroids.
3. Explain how uncontrolled steroid use can result in feminized males and masculinized females.
4. Why is it especially harmful for teens to use steroids? Explain 3 reasons/results.