



Sports Medicine

Flexible Instruction Day

Assignment #1

Learning Standard	Standard CC.3.5.11-12. B Determine the central ideas or conclusions of a text; etc.
Task # & Description	Standard: 607 <i>Identify supplements and ergogenic aids.</i>

CONTACT INFORMATION/ASSISTANCE

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I will be available by email and the Remind app from 7:40-12, and 12:30-3:10 to answer your questions. Please reach out if you are having difficulty completing your assignments.

If you are not receiving messages go here to join ➡ <https://www.remind.com/join/bcavts-sm>

INSTRUCTIONS

- ✓ All work is due on the day we return to school. This is counted towards your attendance **and** as a classroom assignment.
- ✓ Read the attached article from the Cleveland Clinic on Creatine usage.
- ✓ Complete the diagram using the information you were provided in the article.

Name: _____ **Session:** _____ / 30

Creatine

Creatine supplies energy to your muscles. Many people take creatine supplements to build strength and promote brain health. Creatine supplements are safe for most people to take, but you should first talk to a healthcare provider to ensure they're right for you.

Overview

What is creatine?

Creatine is a natural source of energy that helps your **skeletal muscles** flex (contract). It helps create a steady supply of energy in your muscles so they can keep working, especially while you're exercising.

Video content: This video is available to watch online.

View video online (https://cdnapisec.kaltura.com/p/2207941/sp/220794100/playManifest/entryId/1_3loxym10/flavorId/1_5f3sgelj/format/url/protocol/https/a.mp4)

Learn the difference between creatine and whey protein.

About half of your body's supply of creatine (1 to 2 grams/day, about the size of 1 to 2 jellybeans) comes from your diet, especially protein-rich foods such as:

- Red meat (pork, veal and beef).
- Seafood (fish and shellfish).
- Animal milk (like cow, goat and sheep milk).

Your body produces the other half naturally in your **liver, kidneys** and **pancreas**. They deliver about 95% of the creatine to your skeletal muscles to use during physical activity. The rest goes to your **heart, brain** and other tissues.

Manufacturers also make creatine supplements. Some people take creatine supplements because they work out a lot or don't get enough creatine in their diet. Creatine supplements exist as:

- Powders.
- Tablets.
- Capsules.
- Liquids.
- Energy bars.

Is it healthy to take creatine?

Studies show that it's safe for many people to take creatine supplements. However, there isn't enough evidence to know if it's safe if you:

- Are pregnant or breastfeeding.
- Have **diabetes**.

- Have kidney disease.
- Have liver disease.

If you have **bipolar disorder**, creatine may also increase your risk of **mania**.

Talk to a healthcare provider before taking creatine to ensure it's safe for you.

Does creatine make you gain muscle?

It depends. Studies show that regularly taking creatine, weightlifting and exercising can help increase muscle growth in people 18 to 30 years old. However, there isn't enough research to say that creatine helps develop muscle growth in people older than 65 or people with diseases that affect their muscles.

Why do people take creatine supplements?

Many amateur and professional athletes take creatine supplements to aid their workout routines and improve their recovery. Creatine creates "quick burst" energy and increased strength, which improves your performance without affecting your ability to exercise for longer periods (aerobic endurance).

Most athletes who take creatine supplements participate in power sports, including:

- Bodybuilding.
- Football.
- Hockey.
- Wrestling.

In addition, studies suggest that creatine supplements may help brain function in people 60 and older. This includes:

- Short-term memory.
- Reasoning.
- Neuroprotection (keeping groups of **nerve cells** safe from injury or damage).

Researchers are still studying whether creatine supplements may help people with cognitive (mental) conditions, including **dementia**.

Talk to a healthcare provider before taking creatine supplements, regardless of your level of physical fitness, age or health.

Are creatine supplements recommended for athletes?

Many athletes use creatine supplements. Professional sports organizations, the International Olympic Committee (IOC) and the National Collegiate Athletic Association (NCAA) all allow athletes to use creatine supplements.

Men and women report benefits to using creatine. But some studies note that women may not gain as much strength or muscle mass as men.

What is the most common type of creatine supplement?

The most common creatine supplement is creatine monohydrate. It's a dietary supplement that increases muscle performance in short-duration, high-intensity resistance exercises, such as weightlifting, sprinting and bicycling. Other forms of creatine don't appear to have these benefits.

Treatment Details

What happens when you start taking creatine?

Most creatine goes to your skeletal muscles, which convert creatine into a compound of creatine and phosphoric acid (phosphocreatine or creatine phosphate). Phosphocreatine then helps create adenosine triphosphate (ATP). ATP is a source of energy that your cells use when you exercise. So, creatine helps maintain a continuous energy supply to your muscles during intense lifting or exercise.

In addition to providing more energy and helping to increase muscle growth, creatine helps:

- **Speed up muscle recovery.** When you exercise, you create micro-tears in your muscle fibers. As you recover, the micro-tears in your muscle fibers heal, and your muscles get stronger. Creatine helps activate satellite cells in your muscles, which help the micro-tears heal.
- **Increase anabolic hormones.** Anabolic hormones contribute to growth and tissue repair. They include insulin, human growth hormone (hGH), estrogen and testosterone.
- **Boost water content in muscle cells.** Better cell hydration may increase muscle growth and reduce dehydration and muscle cramps.

Creatine can also increase the amount of phosphocreatine in your brain, which may help with your memory.

Should I take creatine every day?

Your body is unique, and how much creatine you take and how often you take it depends on many factors. Before you take creatine, talk to a healthcare provider. They can help determine if it's safe for you to take creatine, as well as the appropriate dosage.

What happens when you stop taking creatine?

When you stop taking creatine, your creatine levels will gradually drop over the next few weeks. Your body will still make creatine naturally, but you may have side effects as you adjust to lower creatine levels. These side effects may include:

- **Fatigue.**
- **Loss of muscle mass.**
- **Weight loss.**
- **A short-term decrease in natural creatine production.**

You should be able to maintain any added strength through regular exercise, but you likely won't see continued improvement.

Risks / Benefits

What are the pros of taking creatine?

For people who work out regularly, studies show that taking creatine supplements may:

- Improve their exercise performance.
- Help their recovery after intense exercise.
- Increase their muscle mass.
- Prevent severe muscle injuries or reduce the severity of muscle injuries.
- Help athletes tolerate more intense activity.
- Reduce dehydration and cramping.

- Minimize muscle tightness, including muscle strains and pulls.

If you're a **vegetarian or vegan**, you may see more significant muscle gains by taking creatine supplements because you don't get creatine through animal-based sources. However, building up creatine levels in your muscles may take longer.

In addition to its athletic benefits, creatine supplements may benefit people who have:

- Neurodegenerative diseases, such as **muscular dystrophy**, **Parkinson's disease** and **Huntington's disease**.
- Diabetes.
- **Osteoarthritis**.
- **Fibromyalgia**.
- Conditions that affect creatine **metabolism**.
- Conditions that affect how creatine transports through your body.
- Insufficient blood flow to your heart muscle (**myocardial ischemia**).

How much bigger does creatine make you?

It depends on your exercise routine. But some studies show that people who take creatine supplements may gain an extra two to four pounds of muscle mass during four to 12 weeks of regular exercise than people who don't take creatine.

Are creatine gains permanent?

If you continue to take creatine, exercise and eat the **best foods to fuel your workout**, you should be able to maintain the strength you gain from taking creatine.

What are the negative effects of creatine?

Creatine is a relatively safe supplement. However, side effects may include:

- Weight gain because of water retention.
- Dizziness.
- Nausea and vomiting.
- Diarrhea.
- Excessive sweating (hyperhidrosis).

If you develop any of these side effects after taking creatine, divide the amount you take each day into smaller doses. Take these smaller doses throughout the day instead of all at once.

When To Call the Doctor

When should I call a healthcare provider?

Talk to a healthcare provider before you take creatine. They'll likely conduct a **physical examination** and ask questions, including:

- Do you currently have any conditions, including diabetes, kidney disease or liver disease?
- Are you taking any medications, vitamins or other supplements?
- Why do you want to take creatine?

- What are your goals?
- Are you pregnant or planning to get pregnant?
- Are you currently breastfeeding?

They'll recommend the best creatine supplement and dosage for you.

It's also a good idea to talk to a healthcare provider if you have side effects after taking creatine.

A note from Cleveland Clinic

Creatine is a compound that your body naturally makes, and you also get it from protein-rich foods. It supplies energy to your muscles and may also promote brain health. Many people take creatine supplements to increase strength, improve performance and help keep their minds sharp. There's a lot of research on creatine, and creatine supplements are safe for most people to take. However, creatine use may cause side effects. If you're thinking of taking creatine, talk to a healthcare provider. They'll help you understand if creatine is right for you.

Experts You Can Trust

✓ **Medically Reviewed.** Last updated on 04/26/2023.

References

Cleveland Clinic's health articles are based on evidence-backed information and review by medical professionals to ensure accuracy, reliability and up-to-date clinical standards.

- American Academy of Orthopaedic Surgeons. Creatine Supplements (<https://orthoinfo.aaos.org/en/staying-healthy/creatine-supplements>). Accessed 4/26/2023.
- Antonio J, Candow DG, Forbes SC, et al. Common Questions and Misconceptions about Creatine Supplementation: What Does the Scientific Evidence Really Show (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7871530/>)? *J Int Soc Sports Nutr.* 2021 Feb 8;18(1):13. Accessed 4/26/2023.
- Avgerinos KI, Spyrou N, Bougioukas KI, et al. Effects of Creatine Supplementation on Cognitive Function of Healthy Individuals: A Systematic Review of Randomized Controlled Trials (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6093191/>). *Exp Gerontol.* 2018 Jul 15;108:166-173. Accessed 4/26/2023.
- Butts J, Jacobs B, Silvis M. Creatine Use in Sports (<https://pubmed.ncbi.nlm.nih.gov/29059531/>). *Sports Health.* 2018;10(1):31-34. Accessed 4/26/2023.
- Hall M, Trojian TH. Creatine Supplementation (<https://pubmed.ncbi.nlm.nih.gov/23851411/>). *Curr Sports Med Rep.* 2013;12(4):240-244. Accessed 4/26/2023.
- Kreider RB, Kalman DS, Antonio J, et al. International Society of Sports Nutrition Position Stand: Safety and Efficacy of Creatine Supplementation in Exercise, Sport, and Medicine (<https://jissn.biomedcentral.com/articles/10.1186/s12970-017-0173-z>). *J Int Soc Sports Nutr.* 2017 Jun 13;14:18. Accessed 4/26/2023.
- National Library of Medicine. Creatine (<https://medlineplus.gov/druginfo/natural/873.html>). Accessed 4/26/2023.
- Wu SH, Chen KL, Hsu C, et al. Creatine Supplementation for Muscle Growth: A Scoping Review of Randomized Clinical Trials from 2012 to 2021 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8949037/>). *Nutrients.* 2022 Mar 16;14(6):1255. Accessed 4/26/2023.

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What is Creatine?

In your own words, what is creatine?	
Who should be cautious or avoid using creatine?	
How might creatine help an athlete?	

	List 3 pros & cons to using creatine
PRO 1	
PRO 2	
PRO 3	
CON 1	
CON 2	
CON 3	

Remember: Supplements can affect everyone differently. Always research and consult a professional before using them!

List 3 Risk & Safety Concerns/Bad Side Effects
1. _____
2. _____
3. _____