What do all of these things have in common?

Drag down

Energy
&
The Cell

Why do cells (and us) need Energy?

1 Cell Growth

2

3

4

Why do cells (and us) need Energy?

1

2 Cell Movement
(in/put of the membrane)

3

4

Why do cells (and us) need Energy?

3 Cell Reproduction

1

2

4

Why do cells (and us) need Energy?

4 ....All cellular functions!

1

2

3

Energy is like a battery:

To get energy we use a molecule, Adenosine Triphosphate (ATP) that is like a battery.
It gets used up and then can be "recharged" to create more.

<u>ATP</u> is the <u>carrier</u> of <u>chemical</u> <u>energy</u> in cells!

Example: Starbucks card carries money

ATP carries chemical energy!

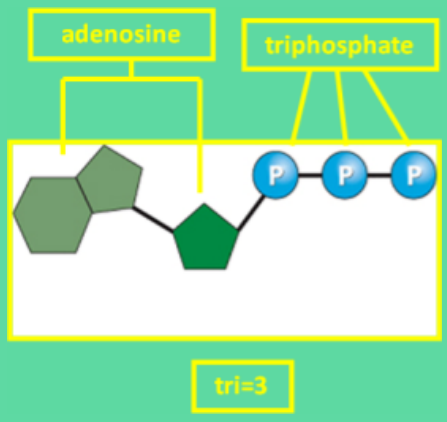
ATP

Is made up of 3 phosphate groups, plus Adenine and Ribose.

Click to reveal

Energy is **released** when a **phosphate** group is **removed** (ATP -> ADP)

Energy is released when the bond is broken



Just like your Starbucks card, when you use it, you use money

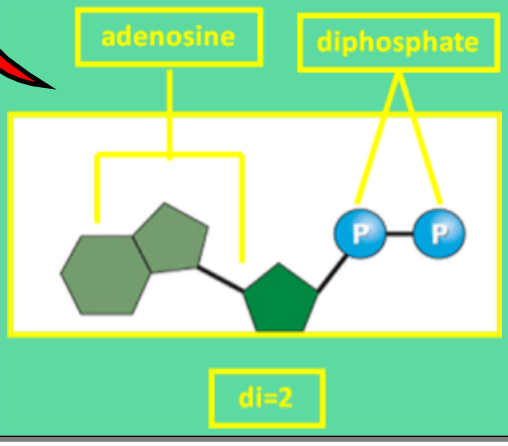
ADP

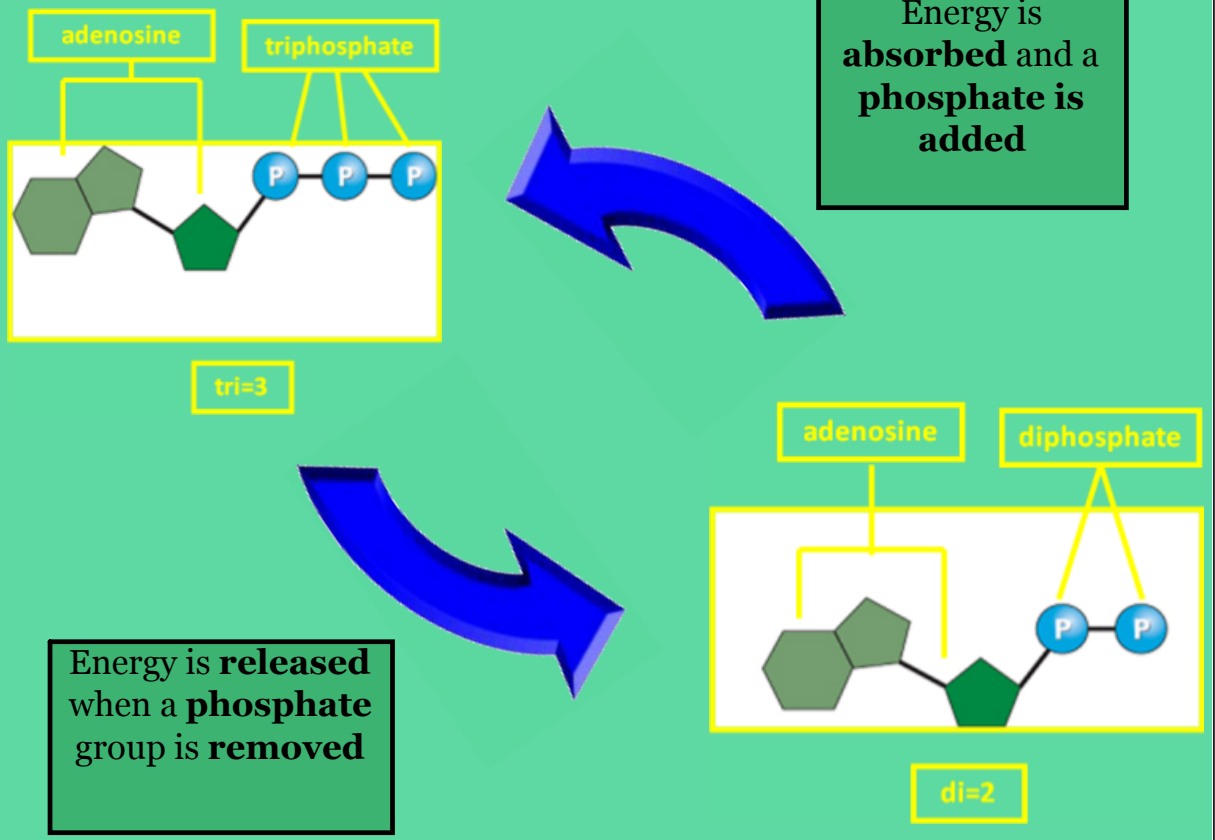
Is made up of 2 phosphate groups, plus Adenine and Ribose.

ADP is changed into ATP when a phosphate group is added (ADP -> ATP)

Just like your Starbucks card, you need to add some money to reload the card

Energy must be put back into the molecule to add a P





Where does it come from?

Organisms break down carbon-based molecules to produce ATP

- **Carbohydrates** are the molecules **most commonly** broken down to make ATP
- **not** stored in large amounts
- up to **36 ATP** molecules from **1 glucose** molecule

- **Fats** store the **most energy**
- Makes up **80%** of the **energy** in your body
- about **146 ATP** molecules from **1 triglyceride**

- **Proteins** are **least likely** to be **broken** down to make ATP
- about the **same** amount of energy as a **carbohydrate**