Dependent and Independent Variables Explained

6th Grade Science
Did you know that if you can add $1+1$ then you can learn today’s lesson about variables?

Ok…here it goes!

$1 + 1 = 2$

So, I guess you’re ready!
2 + _____ = ____

What does this problem equal?

You’re right! It Depends…
2 + 2 = 4

2 + 4 = 6

2 + 50 = 52
In every example, we changed **one** number... and it **affected** the answer!

Therefore, the answer **depended** on the number we changed!
Simple, but try it!

10+___=___

10+___=___

10+___=___

Fill in the above problems to make 3 true math sentences.
You ask…

What does this have to do with Science?
Variables are used in Math and Science!

A variable is... something that can be changed.

In our math problems, the numbers we changed were called variables.

\[ 2 + 2 = 4 \]

A constant is... something that does not change.

In our math problems, the number we decided not to change could be called a constant.
Science experiments use...

**Independent variables** – the one factor changed by the person doing the experiment.

**Dependent variables** – the factor being measured in an experiment.

**Constants** – all the factors that stay the same in an experiment.
In our math problems we used independent and dependent variables too!

Independent variable
(The one number we changed)

2 + 2 = 4

Dependent variable
(The number that depended on the independent variable)

Constant
(It stayed the same)
Now, how does it fit with science experiments?

Imagine you want to do an experiment to test what kind of plant food works the best. Miracle Gro, Jobe sticks, or the name brand.

You would want to be sure that you changed **ONLY** what you are testing so that your results wouldn’t be messed up.
## Our Experiment

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constants</strong></td>
<td>water</td>
<td>water</td>
<td>water</td>
</tr>
<tr>
<td></td>
<td>soil</td>
<td>soil</td>
<td>soil</td>
</tr>
<tr>
<td></td>
<td>light</td>
<td>light</td>
<td>light</td>
</tr>
<tr>
<td></td>
<td>daisy seed</td>
<td>daisy seed</td>
<td>daisy seed</td>
</tr>
<tr>
<td><strong>Independent Variable</strong></td>
<td>Miracle Gro</td>
<td>Jobe’s Sticks</td>
<td>name brand</td>
</tr>
<tr>
<td><strong>Dependent Variable</strong></td>
<td>Plant growth (most)</td>
<td>Plant growth (good)</td>
<td>Plant growth (little)</td>
</tr>
</tbody>
</table>
Our Constants and Variables!

**Constants:**
- The type and amount of dirt (same).
- The amount and timing of watering (same).
- The type and amount of light (same).
- The amount of plant food given (same).

**Independent variable:**
- The brand of plant food testing. (Miracle Gro, Jobes Stick, name brand)

**Dependent variable:**
- The health and growth of the plants.
Here’s How it Works!

- **Constants**: Same types and amounts of water, light, and soil
- **Independent Variable**: Different plant foods tested.
- **Dependent Variable**: Health and growth of plants

Here’s How it Works!
for any experiment, you should be able to identify the constants, independent variables, and dependent variables just by thinking…

\[ 1 + 1 = 2 \]

OR

Constants + Independent Var. = Dependent Var.