# Problem of the Week
## Problem B and Solution
### Interest-ing!

## Problem

Monique and Tyrel were born on the same day. On the day they turned one year old, Monique's parents opened a savings account for her that earned 10% interest per year. Starting that day, Monique's parents put $100 in her account every year on her birthday, stopping just after she turned six. After that, the money remained in the account but Monique's parents did not put in any more money.

Tyrel's parents opened a similar savings account for him, however it wasn't until the day he turned six years old. Starting that day, his parents put $100 in his account each year on his birthday, earning 10% interest per year.

Complete the two given tables to find the total amount of money in Monique's and Tyrel's savings accounts. Who had the better saving strategy over 15 years?

For simplicity, round the interest to the nearest dollar for each year.

## Solution

Examining the total amount of money put into the accounts, and the results in the tables on the following page, we make the following observations.

Monique's parents' put $100 into her account every year for 6 years, which is a total of $100 \times 6 = $600. At the end of 15 years, she had $2000 in her account, which means her account earned a total of $2000 - $600 = $1400 in interest over 15 years.

Tyrel's parents put $100 into his account every year for 10 years, which is a total of $100 \times 10 = $1000. At the end of 15 years, he had $1752 in his account, which means his account earned a total of $1752 - $1000 = $752 in interest over 10 years.

Clearly, Monique's parents had the better savings strategy. Even though her parents put only $600 into her account in the first 6 years, her account earned significantly more interest because the money was in the account for a longer period of time.

## Monique

| Year | Amount at Beginning of Year ($) | Interest Earned ($) | New Total at End of Year ($) |
|---|---|---|---|
| 1 | 100 | 10 | 110 |
| 2 | 210 | 21 | 231 |
| 3 | 331 | 33 | 364 |
| 4 | 464 | 46 | 510 |
| 5 | 610 | 61 | 671 |
| 6 | 771 | 77 | 848 |
| 7 | 848 | 85 | 933 |
| 8 | 933 | 93 | 1026 |
| 9 | 1026 | 103 | 1129 |
| 10 | 1129 | 113 | 1242 |
| 11 | 1242 | 124 | 1366 |
| 12 | 1366 | 137 | 1503 |
| 13 | 1503 | 150 | 1653 |
| 14 | 1653 | 165 | 1818 |
| 15 | 1818 | 182 | 2000 |

## Tyrel

| Year | Amount at Beginning of Year ($) | Interest Earned ($) | New Total at End of Year ($) |
|---|---|---|---|
| 1 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 |
| 6 | 100 | 10 | 110 |
| 7 | 210 | 21 | 231 |
| 8 | 331 | 33 | 364 |
| 9 | 464 | 46 | 510 |
| 10 | 610 | 61 | 671 |
| 11 | 771 | 77 | 848 |
| 12 | 948 | 95 | 1043 |
| 13 | 1143 | 114 | 1257 |
| 14 | 1357 | 136 | 1493 |
| 15 | 1593 | 159 | 1752 |