

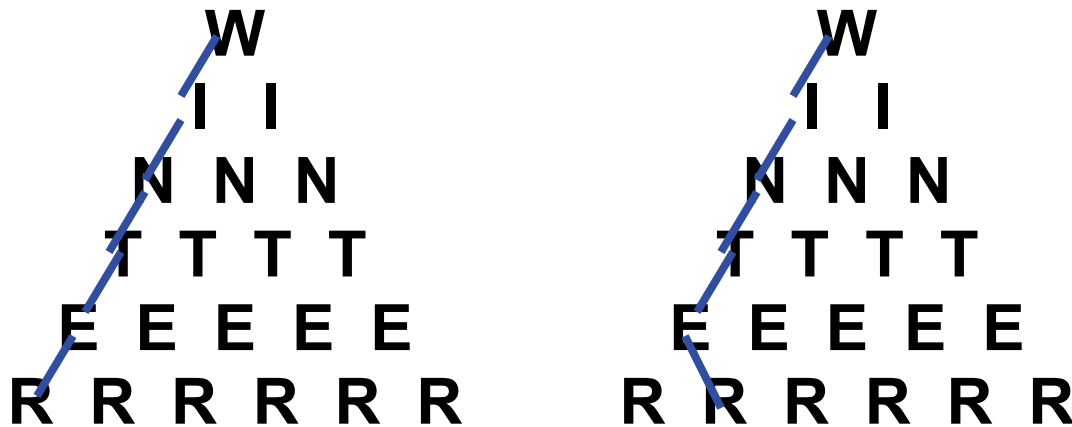
How Many WINTER Paths Do You See?

Discrete Math Investigation



Instructions:

- This lesson builds upon the Pascal's Pumpkins or Pascal's Triangle experience.
- Explain to students that the question asks how many different ways they can spell WINTER using the letter arrangement on the handout.
- Use an overhead to model the process. It is important that students understand that they can only move to one of the two letters directly below any letter. This follows Pascal's Triangle rules. There are, however, many different ways of spelling WINTER.
- Model two DIFFERENT ways to spell WINTER following these rules.



- Encourage students to find all of the others. They will need to use a very orderly approach (systematic counting) to actually come up with the correct answer. Supply students with 2 copies of the WINTER recording sheet and ask them to mark one path in each box.
- ANSWER: Since WINTER has 6 letters, there will be 32 different ways of spelling WINTER since 32 is the sum of the numbers in the 6th row of Pascal's triangle.
- CHALLENGE: Superimpose Pascal's Triangle on the WINTER triangle and challenge students to find one way to get to each end R, 5 ways to get to the next R and 10 ways to get to each inner R.

How
many
WINTER
paths
do you
see?



W

I I

N N N

T T T T

E E E E E

R R R R R R

How
many
WINTER
paths
do you
see?



1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

How Many Winter Paths Do You See? Recording Sheet



W
I I
N N N
T T T T
E E E E E
R R R R R R

W
I I
N N N
T T T T
E E E E E
R R R R R R

W
I I
N N N
T T T T
E E E E E
R R R R R R

W
I I
N N N
T T T T
E E E E E
R R R R R R

W
I I
N N N
T T T T
E E E E E
R R R R R R

W
I I
N N N
T T T T
E E E E E
R R R R R R

W
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T T T T
E E E E E
R R R R R R

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E E E E E
R R R R R R

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R R R R R R

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R R R R R R

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R R R R R R

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R R R R R R

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T T T T
E E E E E
R R R R R R

W
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N N N
T T T T
E E E E E
R R R R R R