

## Welcome to the Boole2School Worksheet- 3<sup>rd</sup> and 4<sup>th</sup> Class

### Section 1 - George Boole

1. Who is George Boole?

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2. Where did he teach in Ireland?

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3. Why are we celebrating him this year?

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### Section 2 - Logic

4. Give an example of a logic argument using assumptions and conclusions:

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5. Decide which of the following is a proposition and which is not:

- (1) What time is it?
- (2) It's time to have some fun.
- (3) This statement you're reading just now is false.

### Section 3 - How do we use Boolean Logic?

6. Give an example of the way Boolean operators AND, OR, NOT are used in the games you play:

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## Section 4 - Truth Tables

### 7. Class exercise:

For every statement  $P$ , one can find an opposite  $\text{NOT}(P)$  by the following rules: whenever  $P$  is TRUE, then  $\text{NOT}(P)$  is FALSE. Whenever  $P$  is FALSE, then  $\text{NOT}(P)$  is TRUE.

Let  $P$  be the statement: "Anna **AND** Brian are happy."

Then  $\text{NOT}(P)$  is: \_\_\_\_\_

Fill out the table with true or false depending on what you see you classmates do

Stages	Statements	
	Anna <b>AND</b> Brian are happy.	Anna <b>OR</b> Brian is <b>NOT</b> happy.
1) Anna 😊, Brian 😞.		
2) Anna 😊, Brian 😊.		
3) Anna 😞, Brian 😊.		
3) Anna 😞, Brian 😞.		

## Section 5- Puzzles

8. **Warm-up game: 20 Questions.** A famous character is written on the board. You and your colleagues need to find out who he/she is in 20 Questions. Write down 3 questions about a character which can be answered with YES or NO.

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**9. Puzzle One** During Halloween, three strange characters visited a Cork school:

a witch  , a goblin  , a ghost  and a black cat 

Each of them went into exactly one of these rooms: classroom 2, classroom 3, classroom 4 and the staff room.





The goblin  stole a notebook  . The cat  painted her paws. 

The ghost  hid in a desk  . The witch  left a present  .

- Clue 1: Nothing was stolen from classroom 4.
- Clue 2: The ghost hid either in classroom 2, or in the staff room.
- Clue 3: Classroom 2 was not visited by a goblin.
- Clue 4: No notebooks or paints are ever kept in the staff room.
- Clue 5: The black cat prowled through one of the smaller number classes.

Where did each of them go?

We will use a truth table to try work out the classrooms they visited. For each box in the table, fill in 1 if the character on that column visited the classroom in that row, and 0 otherwise.

				
Class 2				
Class 3				
Class 4				
Staff room				

### 10. Puzzle Two - The famous River Puzzle:

Every Thursday Farmer John goes to the market. Last week he had a good day and sold nearly all of his produce. He had only three things left to take back to the farm with him. It had been raining all day and the stream by Farmer John's house had turned into a river by the time he got to it. Luckily there was a little boat tied up and he could use it to get across the river. There was a problem though. The boat can only carry the weight of him with one other item. He has a fox, a chicken and a bag of grain to get across the river. He sits on the riverbank and tries to plan his trip.

- If the fox and the chicken are left together, the fox will eat the chicken.
- If the chicken and the corn are left together, the chicken will eat the corn.

**Please help him get home – tell him how to get the fox, the chicken and the grain home safe.**

Hint: It might help to draw the two sides of the river and who is where at each stage.





