



29

Welcome to **ATTACK!** a two-page occasional publication. Most of **ATTACK!** will be concerned with the holistic curriculum which, if acted on, is a fundamental way to undermine the present undemocratic education system. Don't be discouraged if opportunities to teach holistically are limited, do your best, be a guardian, and act as a witness to this culturally significant and inspiring way of teaching and learning. **ATTACK!** is a partner to <https://networkonnet.wordpress.com>

### Holistic mathematics Part 3

A teacher-adapted one-page unit from a detailed online Maths300 unit

<b>Maths 300 Task</b>	<b>'Farmyard Friends'</b>	<b>Years 0 -11</b>
-----------------------	---------------------------	--------------------

<p><b>Curriculum Concepts</b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Logical reasoning</li> <li><input checked="" type="checkbox"/> Combination theory</li> <li><input checked="" type="checkbox"/> Problem solving and posing</li> <li><input checked="" type="checkbox"/> Working mathematically</li> </ul>	<p><b>Resources Needed</b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Playing Board</li> <li><input checked="" type="checkbox"/> Animal Cards</li> <li><input checked="" type="checkbox"/> Investigation Sheet</li> </ul>
---	---

**Summary of Lesson**

**1. Set the Problem / Story**  
 The farmer wants to arrange his animals into the pens so that:  
 The cow is beside the chicken  
 The horse is in the pen at the end  
 The pig comes after the cow  
 The goat is beside the chicken

**2. Explore the Problem**  
 When children find a solution ask, 'Is that the only solution?'  
 How many solutions exist?  
 How do you know you have found them all?

**3. Solving the problem: finding strategies**  
 In searching for more than one solution children realise they need to be systematic.  
 Break the problem into manageable parts  
 Test every possible combination

**4. Finishing the Problem: Conclusion**  
 There are at least 4 solutions.

<b>Cow</b>	<b>Chicken</b>	<b>Goat</b>	<b>Pig</b>	<b>Horse</b>
<b>Goat</b>	<b>Chicken</b>	<b>Cow</b>	<b>Pig</b>	<b>Horse</b>
<b>Horse</b>	<b>Cow</b>	<b>Chicken</b>	<b>Goat</b>	<b>Pig</b>
<b>Horse</b>	<b>Goat</b>	<b>Chicken</b>	<b>Cow</b>	<b>Pig</b>

**5. Extensions**

*a. Student Created Puzzles*  
 Puzzles with exactly one solution - place the animals on the grid as the answer, and then work backwards to generate a set of clues which allows children to solve the puzzle and find the one answer.

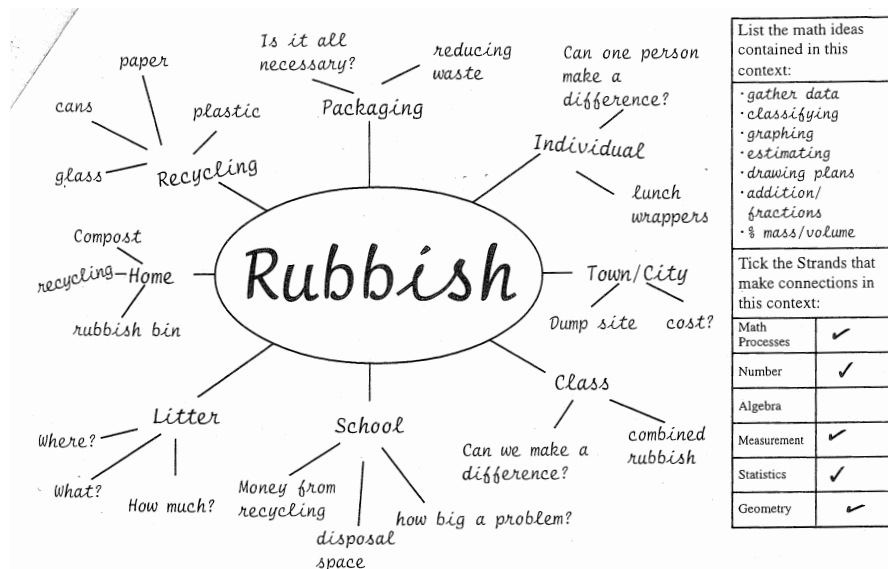
*b. Multiple Solutions*

1. Suppose only one clue was given. Eg. The cow is in the end pen.  
 How many solutions are there?  
 How can you convince me you have found them all? (24 different solutions with the cow in the left hand end and 24 at the right hand end: therefore 48 solutions in all).
2. Use only one clue of the type: 'the horse is not next to the pig (72 solutions in all).
3. Multiple clues such as: The cow is in the end pen. The goat is not next to the cow. (36 different solutions)

*c. Encourage children to make up clues and then solve them.*

A teacher-devised unit (called a contextual unit by the school)

To check coverage, a Menu for Probability and Statistics from online *Maths300*



List the math ideas contained in this context:	
gather data	
classifying	
graphing	
estimating	
drawing plans	
addition/fractions	
% mass/volume	
Tick the Strands that make connections in this context:	
Math Processes	<input checked="" type="checkbox"/>
Number	<input checked="" type="checkbox"/>
Algebra	<input type="checkbox"/>
Measurement	<input checked="" type="checkbox"/>
Statistics	<input checked="" type="checkbox"/>
Geometry	<input checked="" type="checkbox"/>

<b>Teacher Objectives:</b> (Specific Learning Outcomes)	
<ul style="list-style-type: none"> <li>data gathering/classifying</li> <li>graphing &amp; interpreting</li> <li>mapping</li> </ul>	
<b>Learning Area:</b> <u>Mathematics</u>	
Context for Study: <u>Rubbish</u>	
Level: <u>2/3</u> Date: _____	
<p><b>Starter Activity</b></p> <ul style="list-style-type: none"> <li><b>What's in a lunch box?</b> - What's left after you've eaten lunch? Classify: - paper, plastic, cans, scraps, etc.</li> <li><b>Playground Litter - how much?</b> - what times are worst? - Which area of the school?</li> <li><b>Recycling - what can we</b> - recycle - reuse - not reuse - investigate financial return for paper, aluminium, etc.</li> <li><b>Have we improved?</b> Gather data a week later and compare results.</li> </ul>	<p><b>Developing the Idea</b></p> <p>Children make up investigation questions.</p> <p>e.g. How much rubbish from our class in a day / week? What kind of rubbish do we throw away?</p> <p>How can we reduce rubbish? - graphing, weighing</p> <p>data gathering of rubbish types - sorting, counting</p> <p>draw a map of the school grounds - eating areas</p> <p>how can we improve? - devise a plan - rubbish bins, etc. - report to school</p> <p>gather data on recycling materials - count, weigh, etc.</p> <p>prepare a plan for school recycling - include a map.</p> <p>prepare a report to show benefits - money - reduced rubbish, etc.</p> <p>gather playground data, classroom data, recycling data and make comparisons of number count, weights, volume of rubbish.</p> <p>Present findings.</p>
<b>Assessment Task:</b> Presentation of an investigation in #1 above. A completed map of the school.	

### Probability and Statistics Unit Menu

Lesson Title	Main Features	Content Covered
1. Problem Dice	* concrete game * open-ended problem * multiple answers * point of need teaching * software support	* calculating expected values * natural variation * long run frequency * histogram * probability distribution function (Binomial)
2. Temperature Graphs	* small group work * link with geography * software support * personal	* line graphs * reading scales
3. Dice Footy	* popular game context * first hand data * software support	* natural variation * expected results * long-run frequency
4. Win at the Fair	* important social context * collecting first hand data * software support * value of empirical approaches	* simulation modeling * data analysis * expected values * long-run frequency * confidence limits
5. Walk the Plank	* concrete materials * software support * toy-shop scenario	* directed number * probability distribution
6. Cat and Mouse	* game context * mixed ability * concrete materials * open-ended	* expected values * long run frequency
7. Duelling Dice	* game context * first-hand data * software support	* non-transitive property * expected values * concept of proof
8. Birth Month Paradox	* concrete, personal * estimation * mixed ability	* modelling process * frequency graphs
9. Multo	* game format * investigative process * software support * mixed ability	* factors, multiples * link with probability * stem and leaf graph * box and whisker plots
10 Greedy Pig	* open-ended * game context * first hand data	* stem and leaf graph * algebra connections * working mathematically
11. Choc Chip Cookies	* industrial context * concrete * first hand data	* simulation modeling * stem and leaf graph * natural variation
12. The Game Show	* TV game show context * problem solving * first hand data	* calculation of chance * sequences and series