Name: _____

Class: _____ Date: _____

Maths for Recycling

An activity of "Setting sail on an important mission"

Plastic waste is overwhelming the planet. It has reached dangerous proportions, and we need to find a solution. **"Setting sail on an important mission"** (page14–15, *What's Up* June 2020) tells of exciting and innovative ways some are doing it. Read it carefully.

A. Fill in the gaps with correct answers. Clues are given where needed. You may use the other side of this sheet to show your working clearly.

1. In June 2019, on a beach in India, (a) ____ tonnes, which is (b) _____kg, of garbage that was mostly plastic washed ashore in a few days.
   CLUE for (a): Prime factor of 625. CLUE for (b): 1 tonne = 1,000k

2. It took 50 people 3 hours to clear 5 tonnes of plastic litter on a 5km stretch of beach in Kenya. If only five people did the job, it would take (a) _____ hours to clear the same litter, as the time taken to do the job is (b) _____ proportional to the number of people doing it. Wow!
   (c) _____ hands make light work. Better still, vow not to litter!
   CLUE for (c): Opposite of 'few

3. Mr Morrison and his team collected 33 tonnes of plastic waste on a 10km stretch of beach. The average discarded plastic they collected per metre-long stretch of the beach was _____ kg/m. Do you think this is a lot of litter? _____.

4. According to the UN Environment Programme (UNEP) more than (a)_____ million tonnes of plastic end up in the ocean annually; that's equal to dumping (b)_____ garbage truck of plastic per minute, at a cost of around (c) $_____ billion, in damage to marine ecosystems.
   CLUE (a) The smallest composite number which is a perfect cube. CLUE (b) The positive integer that is neither composite nor prime, written in words.
   CLUE for (c): $(512)^{1/3}$

5. It is estimated that, by 2050, the ratio of **plastic to fish** (by mass) in the oceans will be **1:1** and _____% of seabirds will have plastic in their bodies. By our inaction, we will fail them.
   CLUE: The smallest positive integer k for which 363k is a perfect cube.

6. In 2019, Singapore generated about (a) _____ tonnes of plastic waste and only 37,000 tonnes were recycled. Hence, in 2019, (b) _____ % of such plastic waste is not recycled and tonnes of it find its way onto the shores of Singapore. The good news is that local conversion technology could soon turn our plastic trash into useful treasure.
   CLUE for (a): $3\ (3^3 + 4) \times 10^4$

B. Plastic is useful, but we must reduce harmful litter. Keeping in mind 2(c), list three plastic objects students can refuse, reduce or reuse to **address the problem of plastic trash**.

1. A plastic object that I can **refuse** (not use): _____ .

2. A plastic object that I can **reduce** (use less of): _____ .

3. A plastic object that I can **reuse** (use again): _____ .