

## Thinking Tasks and Activities

The following activities are designed for students to work together in pairs or small groups and think collaboratively about a certain problem. It is best that these problems are solved on vertical non-permanent surfaces (ie. a white board with students standing up). If this is not possible, have students work on larger sized pieces of paper or using white board pens on desks, if pen marks can be easily erased.

An important note: there is no right or wrong way to answer or complete these tasks. Students can answer the question or complete the task any which way they can!

### **Task 1: Tricky Cards**

Every student needs a deck of cards OR share a deck per 4 people and students can split the deck evenly.

*Note: teachers can go to any casino and receive a box of used cards for free; an excellent resource for any teacher to have as an extra trick*

Instructions:

1. Each student should have 5 cards in their hand (A, 2, 3, 4, 5) – different suits is just fine
2. Students will arrange the cards in their hand in a particular way so the cards come out in order from ace to 5
3. Students will bunch the cards face down in their hand
4. The method is to discard the top card to the bottom of the pile, and flip the next card face up on the table
5. The new card on top and discarded to the bottom on the pile, and the top card is flipped onto the face up card which is already located on the table
6. This trend continues until all 5 cards have been placed on the table and are in order from ace, 2, 3, 4, 5
7. Once students are able to do this, tell them to add another card until they can do it
8. Students can add up to as many cards as they wish

This is a great activity for students to complete individually while socializing with their peers. It is a great thinking game and gives students a bit of a competition.

## **Task 2: Money Madness**

Students are to work in groups of 3 or 4 for this task. If possible, make sure students are coming up with ideas and showing their work on a white board. This makes it possible for students to erase, thinking of new ideas, and take a look around to see how others are solving the problem. This is a great form of collaboration. If students are not able to work on white boards, let them work at their desk, with many pieces of paper so they do not become attached to an idea that may not be working.

The purpose of this task is to have students work together to come to a final solution. There is no correct way to solve the problem. An answer is not provided either. This is because we would like students to work towards a goal rather than work to find an answer.

### **The question:**

I have lined up a row of 1000 quarters, every 4<sup>th</sup> quarter is replaced with a loonie, every 2<sup>nd</sup> coin is replaced with a dime, and every 3<sup>rd</sup> coin is replaced with a nickel. How much money is left?

### **Instructions:**

1. Write the question on the board or projector for students to reference
2. Ask students to formulate groups of 3 or 4 OR formulate groups yourself
3. Students are to work on paper or on white boards to come up with a solution to the problem

*Note: usually students love this activity and become quite involved in solving it – make sure to keep students attention captured (ie. do not give them more time than they may need – judge the classroom atmosphere accordingly)*

### **Task 3: Bumble Bee Reproduction**

Students are to work in groups of 3 or 4 for this task. If possible, make sure students are coming up with ideas and showing their work on a white board. This makes it possible for students to erase, thinking of new ideas, and take a look around to see how others are solving the problem. This is a great form of collaboration. If students are not able to work on white boards, let them work at their desk, with many pieces of paper so they do not become attached to an idea that may not be working.

The purpose of this task is to have students work together to come to a final solution. There is no correct way to solve the problem. An answer is not provided either. This is because we would like students to work towards a goal rather than work to find an answer.

*Note: For this task, there are two options: easy and difficult. You may start with the easier version and move to the harder version OR you may judge groups according to how they are working and assign the harder one as necessary.*

#### **The question:**

##### *Easier version*

A single pair of bumble bees reproduces to make 4 new bees. If each of these makes 4 more bees, how many bees are born after 10 reproductions?

##### *Difficult version*

A single pair of bumble bees, one male and one female, reproduce to make 4 new bees. Assume 50% male and 50% female are born. If only FEMALES can give birth, how many bumble bees are born after 12 reproductions?  
(assume 50% male and 50% female are born after each birthing)

#### **Instructions:**

1. Write the question on the board or projector for students to reference
2. Ask students to formulate groups of 3 or 4 OR formulate groups yourself
3. Students are to work on paper or on white boards to come up with a solution to the problem