### Mark’s Metrocard - A 3 Act Math Task

Materials:

* Video: <http://bit.ly/marksmetrocard>
* Abridged MTA fare info sheet
* Act 3 cards

### Act One

* I’d like to start by showing a short video: [Mark’s Metrocard](http://bit.ly/marksmetrocard) (Watch video twice)

#### **Write down the first question that comes to your mind. Just one question.**

* Share your question with a partner. See if it is the same question or a different question.
* Ask for volunteers to share their questions. Take notes on the board. What other questions do you have?
* For each, ask for a show of hands, “Who would like to know the answer to that question?”
* “It would be great to try to answer all these questions, but since we have a limited amount of time, I’m going to highlight these questions. These are the questions I would like you to prioritize. If you can answer other questions, please do, but focus on these first.
  + **How many trips did Mark take before he ran out of funds?**
  + **How much money was left on the card?**

### Act Two

#### **What information do you need from me in order to answer our question/s?**

* Make a list - on your own first and then talk to the people around you.
* Write down their requests.
* Answer questions. Hand out MTA fare info sheet.

#### **Problem-Solving**

* Let participants work on the problem - **10 minutes** solo, then in groups
  + Extensions for anyone finished (warning: some of these questions are really challenging!)
    - What would have been a better amount of money to put on the card in the beginning (so that money isn’t left on the card)?
    - How much money should Mark add to the $1.75 so that he doesn’t waste money next time?
    - What is the smallest amount of money you could put on the card and not have money left over?
    - What if you had a card with \_\_\_ in value on it? How much money could you add so that none would be wasted?
    - Imagine this situation: When Mark gets down to $1.75 on his card, he adds another $20 in value. How much is on the card now? If I swipe, swipe, swipe until all trips are gone, is there a remainder? If so, add another $20 in value. How long will it take to get to an empty card?
    - My friend David adds $40 each time he sees “insufficient funds” when he swipes at the turnstile. If he starts by spending $40 on a new card and adds $40 every time he runs out, how long (how much money, how many refills) will it take him to get to 0 value on the card?
    - Why do you think the MTA created a system with such messy remainders? Can you think of a better system to collect money and give bonus for larger purchases?

### Act Three

#### **Presentations**

* Ask to explain their solutions to How many trips did Mark take and how much money is left on the card?

**Share**

* Act 3 video - Mark’s Metrocard (<http://bit.ly/marksmetrocardact3>)
* MTA pre-valued MetroCard information