

# Agricultural Cyberbiosecurity

## Cybersecurity to Solve the Mystery of the Kentucky Derby Disappearance!

### About this activity

In this activity, you will act as a private investigator trying to figure out what happened to a prized Kentucky Derby racehorse that has gone missing. Pay close attention to the clues to see if you can tell who is responsible!

### SOLs and CTE competencies:

- CS 6.6: identify physical and digital security measures used to protect electronic information.
- CS 7.7: The student will identify existing cybersecurity concerns associated with Internet use and Internet-based systems and potential options to address these issues.
- Ag 8002: 45. Explain the economic significance of various plants and animals to the community.
- Ag 8003: 39. Describe the relationship of agriculture to other segments of society. 65. Describe new technologies in animal science.
- Ag 8004: 37. Explore new and emerging technologies in agriculture and agriscience.
- CTE Prof Comp: Demonstrate an understanding of information security. Includes: describing cybersecurity, identifying various information types/formats, and using technology ethically.

### Learning

#### objective:

Describe the importance of cybersecurity in ensuring accuracy, security, and storage of data in agricultural systems.

### You will need:

1. This activity guide
2. Pencil or pen

## Vocabulary:

1. **Microchipping:** implanting a microchip under the skin of an animal as a means of identification. Microchips store electronic information such as identification numbers.
2. **DNA testing:** use of DNA profiles to determine parental relationships. Commonly used in the livestock industry for documenting pedigree.
3. **Cybersecurity:** Protection of computer systems and networks from the theft of or damage to their hardware, software, or electronic data, as well as from the disruption or misdirection of the services they provide.
4. **Data security:** Protection of data from theft or manipulation.
5. **Data storage:** use of technology to keep data using computers or other devices.
6. **Data:** information gathered by the observation of people, things, or objects and can measure quantities, traits, or characteristics



## Part 1: The case!



*You roll out of bed, phone ringing, swipe the answer key and groggily ask who is calling. You wake up sharply when you realize it is your cousin Vinny, calling with a case for your fledgling PI business. You stumble over to your desk and fire up the laptop, quickly browsing to the newest news releases and find the article Vinny was talking about:*

**BREAKING NEWS: Top Kentucky Derby Contender Disappears Before Race For Immediate Release**

Richmond, VA. This morning, the VA community was shocked to learn that MegaByte, the top-ranked and VA-bred Kentucky Derby contender, had disappeared during transport just 4 days before the starting bell rings. MegaByte, a 3-year-old superstar owned by Donald Bytes, self-made computer billionaire and business mogul, was transported from his training stable run by notable, multi-time Kentucky Derby winning trainer Doug Waffle, to Churchill Downs overnight; however, upon turning up to feed him this morning MegaByte's groom, Celeste Hammel, found his stall empty and no sign of the potential champion on the grounds. "I'm devastated," Hammel remarked in an interview with the Independent Press, "Chomper just put in one of his best works and I'm certain he would have performed exceptionally this weekend." "Chomper", as MegaByte is lovingly referred to around the farm, had indeed, just clocked the best training time of any horse in the field, stomping the personal record of GoPhish the horse identified as MegaByte's major competition for the garland of roses. When we interviewed George Lopez, owner of GoPhish, about the developing situation he remarked "we are very saddened for MegaByte's connections and hope they are able to recover the horse before this weekend – it was certainly shaping up to be quite an exciting race." Indeed, the horse racing community is on pins and needles, waiting for any developments that might lead to MegaByte's recovery and inclusion within the race. Donald Bytes, owner of this racehorse, is offering a reward of \$500,000 for the location and successful recovery of MegaByte.



As a new PI, this could be your break-out case! You immediately dig into the evidence and begin making inquiries. The first thing you do is identify the potential individuals who may have information about MegaByte's whereabouts. You have summarized the people who you think could be suspects in the table below. Use this table to summarize what you know about the potential suspects, their connection to MegaByte, and their activities over the past few days:

## Part 1:

## Your job!

Suspect	Connection to MegaByte	Activities from 8 pm to 8 am on Tuesday Evening
Donald Bytes	Owner	
Doug Waffle	Trainer	
Celeste Hammel	Groom	
George Lopez	Owner of Rival Horse	
Tamra Bytes	Wife of owner	
Marina Bytes	Daughter of owner	
Harrold Vance	Transporter	
Felicia Kind	Trainer of Rival Horse	

## Who are your top suspects? Why?

1.

2.

3.

4.

5.

### Part 1: Rank your suspects

*Investigations ramp up into George Lopez and Felicia Kind – could the Kentucky Derby Disappearance be foul play?!*

Add your notes here:

## Part 2

### Suspects Ruled Out

### Important Clues

***BREAKING NEWS: Lopez pulls GoPhish amid Kentucky Derby Scandal allegations***

Add your notes here:

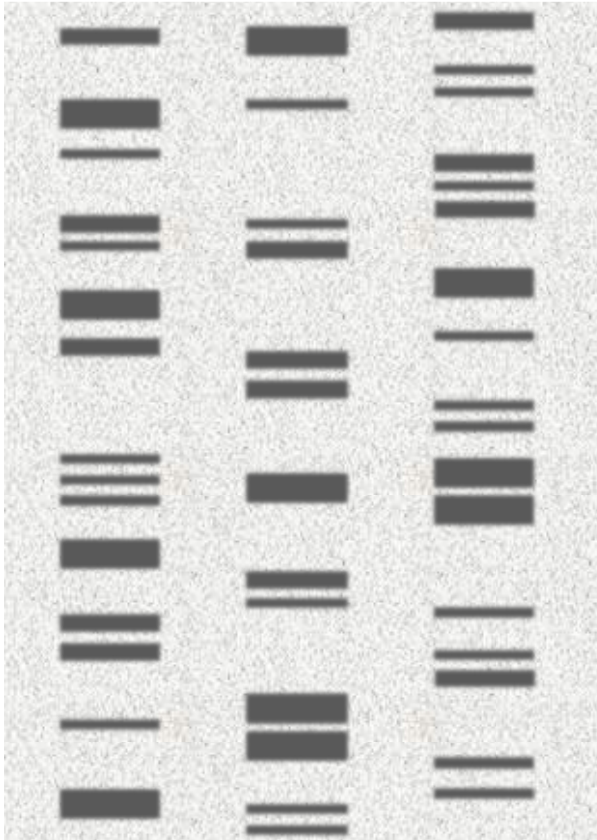
## Part 3

### Suspects Ruled Out

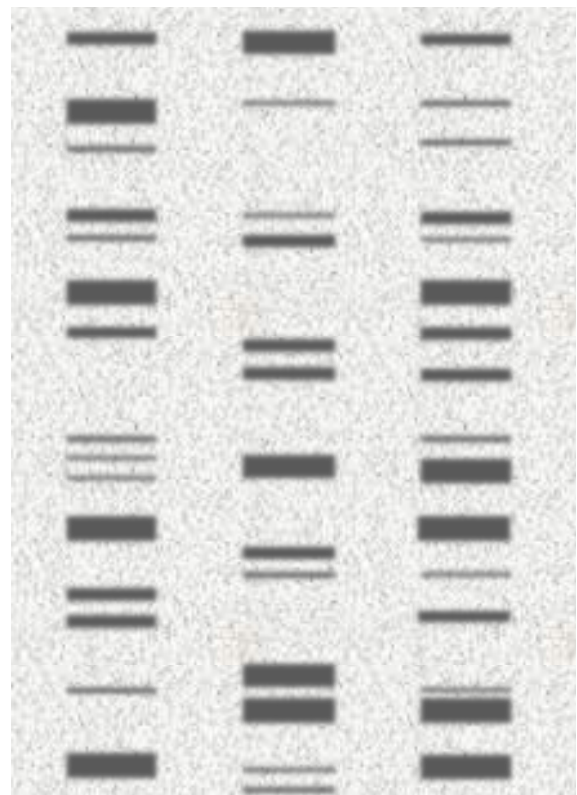
### Important Clues

## Part 3 (continued): DNA Paternity Test Data

Dam      Sire      Unknown sample



Dam      Sire      MegaByte registered sample



*BREAKING NEWS: Vance claims horse was not dropped off at Churchill Downs*

Add your notes here:

## Part 4

### Suspects Ruled Out

### Important Clues



*Donald Bytes wants answers! He calls you up and asks for a full report of your findings and your top suspect.*

What parts of the story don't add up?

## Part 5

What do you know about when the horse was received?

**Who done it? How? Why?**



# Questions

## Share

What role does identification data play in agricultural systems?

What role does location data play in agricultural systems?

## Generalize

What other data vulnerabilities can you think of in agricultural systems?

## Apply

What ideas do you have for a new technology or software that could help protect data in agricultural systems?

## Learn more

To learn more about cyberbiosecurity concepts in this activity, you can read the Fact Sheets in the Cyberbiosecurity Education Resource Collection at <https://doi.org/10.21061/cyberbiosecurity>

These topics are a good place to start to build on what you learned in this activity:

- Cyberbiosecurity
- Data Literacy
- Sensors

# Acknowledgments

## Authors

This activity was developed by Amy Whitten, Kate Hawkins, and Robin White. Hannah H. Scherer, David Smilnak, Donna Westfall-Rudd, Joseph Simpson, and Erika Bonnett provided editorial support. It was reviewed by additional members of the project team and advisory board, including Sally Farrell, Jonette Mungo, and Teresa Lindberg.

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This definition of OER is provided by [The William and Flora Hewlett Foundation](#).

## How to access these templates

The main landing page for these resources is <https://doi.org/10.21061/cyberbiosecurity>.

This page includes a downloadable and editable Word document for the:

- Student fact sheet
- Student activity sheet
- Faculty guide

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