Grids

Definition

Digital grids and tables share similar formats and navigation methods.

- A **grid** is an arrangement of items in a rectangular format with **rows and columns**.
- A **table** is also structured with rows and columns but is specifically used to organize detailed or complex data for easy reference.

Why Are Digital Grids Important On An iPad?

App developers use familiar spatial layouts to help children understand and navigate content effectively. Grids are commonly used to display multiple rows of items, such as:

- App icons on the iPad's Home Screen
- Preschool and early elementary educational apps that help young students develop a mental map of item locations

For blind or low-vision students, grids and tables provide an accessible way to navigate and understand spatial relationships. VoiceOver row and column announcements further support memorization of item locations, enhancing navigation skills and overall spatial awareness.

Prerequisites

Before introducing digital grids, students should:

- Learn about grids using **tactile materials**
- Practice the drag gesture (including dragging in a straight line)
- Understand spatial locations, rows, and columns

Note: VoiceOver Playground introduces grids but does not include formal tables. However, grid concepts can be applied to tables.

How Does VoiceOver Announce Grids And Tables?

- **For tables**:
  - VoiceOver announces the title of the table, followed by **how many** rows and columns.
  - Note: VoiceOver announces row and column **headers** instead of generic row/column numbers.
- **For grids**:
  - Grids do not have a title, and the rows and columns do not have headers.
  - VoiceOver only announces **how many** rows and columns.

When a child touches a square in a grid, VoiceOver will announce:

1. The name of the item in that square.
2. The row then column header, or the number of the row then column (only for the first square touched).
    - As the user moves, VoiceOver announces only the **new** row or column

Building a Mental Map of a Grid

Children should learn to listen closely to the VoiceOver announcements and then visualize the grid.

- **Example shapes:**
    - A 2x6 grid (2 rows, 6 columns) is a long, skinny rectangle**.**
    - A 6x2 grid (6 rows, 2 columns) is a tall, skinny rectangle.
    - A 3x3 grid forms a square**.**
- **Example spatial awareness:**
    - If an item is in Row 1, Column 6, it is in the top-right corner of the grid.

How To Navigate Grids?

1. **Dragging a finger to learn rows and Columns**
    - Initially, children should drag their finger systematically left to right across the grid.
        - This reinforces the spatial layout and helps them develop a mental map.
        - The **physical location** of their finger on the screen provides key information about where each square is located. VoiceOver announcements and earcons further reinforce this understanding.
2. **Listening for VoiceOver announcements**
    - If a child drags **left to right** across Row 1 and suddenly hears "Row 2", this indicates they have accidentally moved downward instead of maintaining a straight line.
    - Encouraging **careful listening** helps children adjust their movements and refine their mental map of the grid.
3. **Using swipe gestures** (After mastering grid concepts)
    - Once a child has a strong understanding of grids, they can switch to swiping instead of dragging.
        - Listening for the next row or previous row earcon helps them track their position in the grid and follow along using their mental map.
    - *Note:* To navigate **up/down within a grid**, the Rotor must be set to **Rows**, then 1-finger swipe up/down can be used.
        - The VoiceOver Playground grid lessons and games uses the drag gesture and, in some cases, 1-finger swipe right and left.

Earcons

- A “click” earcon is heard when navigating from item to item across the row.
- An ascending double tone is heard when moving from one row to the **next** row.
- A descending double tone is heard when moving from one row to the **previous** row.

Lessons

Lesson 1: 1-Finger Tap

Lesson 2: Drag and Split-tap
Lesson 3: Row Activity
Lesson 4: Column Activity
Lesson 5: Grid Activity

- **Goal**: Teach children to navigate and identify objects within a grid while reinforcing rows and columns concepts.
- **Screen Layout**:
    - A 9-burrow grid displayed in a field.
- **Breakdown**:
    - Drag a finger to any burrow in Row 2 and split tap to select it.
    - Drag a finger to any burrow in Column 3 and split tap to select it.
    - Drag a finger to the burrow located in Row 1, Column 2, and split tap to complete the lesson.

This structured approach helps children develop essential spatial awareness and navigation skills when interacting with digital grids. By practicing dragging, split tapping, and listening to VoiceOver cues, children gain confidence in using accessible technology and understanding screen layouts.