Here are 10 test cases that could be used to evaluate a device for displaying tactile graphics to the blind:

1. A simple line drawing, such as a map of a city or a diagram of a mechanical system. This will test the device's ability to accurately represent basic shapes and lines.
2. A more complex line drawing, such as a detailed architectural plan or a **circuit diagram**. This will test the device's ability to accurately represent a wide range of shapes and lines, as well as its ability to convey detailed information.
3. A graph or chart, such as a bar chart or line graph. This will test the device's ability to convey quantitative information in a clear and intuitive way.
4. A photograph or other image with a wide range of tones and colors. This will test the device's ability to represent different levels of contrast and detail, as well as its ability to convey the overall composition of an image.
5. A diagram or illustration with labeled parts, such as a labeled diagram of the human body or a labeled map of a building. This will test the device's ability to convey detailed information and provide clear labels for different parts of the image.
6. A pie chart or other diagram that uses angles to convey information. This will test the device's ability to represent angles and circular shapes accurately.
7. A diagram or illustration with multiple layers or levels, such as a cross-section of a building or a multi-layered diagram of a complex system. This will test the device's ability to represent multiple levels of information and convey the relationships between different parts of the image.
8. Text in a variety of fonts and sizes. This will test the device's ability to accurately represent different fonts and sizes, as well as its ability to convey the overall layout of text on a page.
9. A 3D model or illustration. This will test the device's ability to represent 3D shapes and convey spatial relationships between different parts of the image.
10. A combination of different types of information, such as text, diagrams, graphs, and photographs. This will test the device's overall versatility and ability to convey a wide range of information in a clear and intuitive way.

Here are 10 additional test cases that could be used to evaluate a device for displaying tactile graphics to the blind, specifically focused on conveying information that would be covered in a K-12 classroom setting:

1. A math problem or equation, such as a long division problem or a system of linear equations. This will test the device's ability to accurately represent mathematical symbols and equations.
   1. Basic arithmetic operations, such as addition, subtraction, multiplication, and division. These could be represented using the standard braille symbols for each operation.
   2. Fractions, decimals, and percents. These could be represented using the standard braille symbols for fractions and decimals, as well as the braille symbol for "percent."
   3. Algebraic expressions and equations. These could be represented using the standard braille symbols for variables, constants, and the four basic operations.
   4. Geometry concepts, such as points, lines, angles, and shapes. These could be represented using the standard braille symbols for geometric figures and the braille symbols for common geometric terms.
   5. Trigonometry concepts, such as angles, triangles, and trigonometric functions. These could be represented using the braille symbols for common trigonometric terms and the standard braille symbols for trigonometric functions.
   6. Calculus concepts, such as limits, derivatives, and integrals. These could be represented using the standard braille symbols for calculus terms and operations.
   7. Set theory concepts, such as sets, subsets, and unions. These could be represented using the standard braille symbols for set theory terms and operations.
   8. Statistics and probability concepts, such as mean, median, mode, and standard deviation. These could be represented using the standard braille symbols for statistical terms and operations.
   9. Matrix algebra concepts, such as matrices, determinants, and eigenvalues. These could be represented using the standard braille symbols for matrix algebra terms and operations.
   10. Number theory concepts, such as prime numbers, composite numbers, and divisibility rules. These could be represented using the standard braille symbols for number theory terms and operations.
2. A scientific illustration, such as a diagram of the solar system or a cross-section of a plant. This will test the device's ability to represent scientific concepts and diagrams in a clear and intuitive way.
   1. Diagrams of biological cells, showing the different organelles and their functions.
   2. Diagrams of biological systems, such as the circulatory system or the digestive system.
   3. Diagrams of the solar system, showing the positions and relative sizes of the planets.
   4. Diagrams of geological structures, such as mountain ranges or faults.
   5. Diagrams of chemical compounds and reactions, showing the arrangement of atoms and the bonds between them.
   6. Diagrams of the electromagnetic spectrum, showing the different types of electromagnetic radiation and their wavelengths.
   7. Diagrams of the structure of atoms, showing the arrangement of protons, neutrons, and electrons.
   8. Diagrams of the structure of molecules, showing the arrangement of atoms and the bonds between them.
   9. Diagrams of the structure of proteins, showing the sequence of amino acids and the three-dimensional shape of the molecule.
   10. Diagrams of the structure of DNA, showing the double helix structure and the base pairing of the nucleotides.
3. A timeline or historical map, such as a timeline of significant events in a particular time period or a map of a region showing the movements of different groups over time. This will test the device's ability to represent time-based information and convey the relationships between different events or locations.
   1. A timeline of the evolution of life on Earth, showing the appearance of different groups of organisms over time.
   2. A timeline of significant events in world history, such as wars, revolutions, and technological advances.
   3. A timeline of the history of a particular country or region, showing the major events and political developments that have shaped its history.
   4. A timeline of the history of a particular field or discipline, such as art, science, or technology.
   5. A timeline of the history of a particular company or organization, showing its founding, growth, and major milestones.
   6. A map of a region showing the movements of different groups of people over time, such as migrations, invasions, and colonizations.
   7. A map of a region showing the changing borders and political divisions over time, such as the growth and contraction of empires or the formation of new states.
   8. A map of a region showing the development of transportation networks over time, such as the growth of railroads or the construction of highways.
   9. A map of a region showing the expansion of urban areas over time, such as the growth of cities or the development of suburbs.
   10. A map of a region showing the changes in its physical landscape over time, such as the formation of mountains or the erosion of coastlines.
4. A map of a country or region, showing physical features such as mountains, rivers, and lakes. This will test the device's ability to represent geographical information and convey the relationships between different physical features.
   1. A map of a country or region showing its major physical features, such as mountains, rivers, and lakes.
   2. A map of a country or region showing its political divisions, such as provinces, states, or counties.
   3. A map of a country or region showing its major cities and towns.
   4. A map of a country or region showing its transportation networks, such as roads, railways, and airports.
   5. A map of a country or region showing its natural resources, such as forests, minerals, and water sources.
   6. A map of a country or region showing its climate zones, such as tropical, temperate, or polar regions.
   7. A map of a country or region showing its vegetation zones, such as forests, grasslands, or deserts.
   8. A map of a country or region showing its population density, such as areas of high or low population concentration.
   9. A map of a country or region showing its cultural or linguistic regions, such as areas with distinct traditions, languages, or religions.
   10. A map of a country or region showing its economic activity, such as areas of industry, agriculture, or tourism.
5. A diagram of the human body, showing the different organs and systems. This will test the device's ability to represent detailed anatomical information and convey the relationships between different parts of the body.
   1. A diagram of the human skeleton, showing the bones and their connections.
   2. A diagram of the human muscles, showing their locations and actions.
   3. A diagram of the human circulatory system, showing the heart, blood vessels, and blood flow.
   4. A diagram of the human respiratory system, showing the nose, trachea, lungs, and bronchi.
   5. A diagram of the human digestive system, showing the mouth, esophagus, stomach, and intestines.
   6. A diagram of the human urinary system, showing the kidneys, ureters, bladder, and urethra.
   7. A diagram of the human reproductive system, showing the male and female reproductive organs and their functions.
   8. A diagram of the human nervous system, showing the brain, spinal cord, and nerves.
   9. A diagram of the human endocrine system, showing the glands and hormones that regulate the body's functions.
   10. A diagram of the human immune system, showing the organs and tissues that protect the body against infections and diseases.
6. A chart or graph showing data about a particular topic, such as the population of different countries or the results of a scientific experiment. This will test the device's ability to represent data and convey trends or patterns.
   1. A bar chart showing the population of different countries or regions.
   2. A line chart showing the trend of a particular variable over time, such as the stock price of a company or the temperature of a region.
   3. A pie chart showing the distribution of a particular variable among different categories, such as the market share of different companies or the expenditure of a household.
   4. A scatter plot showing the relationship between two variables, such as the relationship between income and education level or the relationship between weight and height.
   5. A histogram showing the distribution of a particular variable among a continuous range of values, such as the distribution of ages in a population or the distribution of test scores in a class.
   6. A bar chart or line chart showing the comparison of two or more variables, such as the comparison of the sales of different products or the comparison of the temperatures in different cities.
   7. A stacked bar chart or stacked area chart showing the composition of a particular variable, such as the composition of a company's revenue by product line or the composition of a country's exports by sector.
   8. A box plot showing the distribution of a particular variable and its statistical measures, such as the median, quartiles, and outliers.
   9. A tree map showing the hierarchical structure of a particular variable, such as the structure of a company's departments or the structure of a government agency.
   10. A radar chart or spider chart showing the comparison of multiple variables around a central point, such as the comparison of the performance of different athletes or the comparison of the features of different products.
7. A reading passage or piece of literature, such as a poem or a short story. This will test the device's ability to represent text in a clear and intuitive way, as well as its ability to convey the structure and layout of the passage.
   1. A poem with regular rhyme and meter, such as a sonnet or a villanelle.
   2. A poem with irregular rhyme and meter, such as a free verse poem or a concrete poem.
   3. A short story with a clear plot and character development, such as a narrative with a beginning, middle, and end.
   4. A short story with an unconventional structure, such as a story told out of order or a story with multiple narrators.
   5. A non-fiction passage with a clear structure and argument, such as an essay or an article.
   6. A non-fiction passage with an unconventional structure, such as a document with multiple sections or a passage with embedded quotes or images.
   7. A passage of dialogue from a play or novel, showing the conversation between two or more characters.
   8. A passage of descriptive text, showing the setting, characters, or objects in a scene.
   9. A passage of expository text, explaining a concept or idea in a clear and logical way.
   10. A passage of persuasive text, trying to convince the reader of a particular point of view.
8. A timeline or schedule showing the order of events or activities in a particular situation, such as the schedule for a school day or a list of tasks to complete. This will test the device's ability to represent time-based information and convey the order of events.
   1. A schedule for a school day, showing the start and end times of different classes, as well as any breaks or lunch periods.
   2. A schedule for a work day, showing the start and end times of different shifts, as well as any breaks or meetings.
   3. A schedule for a sports event or practice, showing the start and end times of different activities, as well as any warm-up or cool-down periods.
   4. A schedule for a public event or festival, showing the start and end times of different activities, as well as any breaks or performances.
   5. A timeline for a historical event or period, showing the order of events and the duration of different phases.
   6. A timeline for a scientific process or experiment, showing the order of steps and the duration of different phases.
   7. A timeline for a personal project or goal, showing the tasks to be completed and the deadlines for each step.
   8. A timeline for a group project or goal, showing the tasks to be completed and the deadlines for each step, as well as the roles and responsibilities of different team members.
   9. A schedule for a vacation or travel itinerary, showing the order of
9. A diagram or illustration of a process or procedure, such as the steps in a scientific experiment or the operation of a machine. This will test the device's ability to represent sequential information and convey the relationships between different steps in a process.
   1. A flowchart showing the steps in a scientific experiment, such as the setup, data collection, and analysis.
   2. A flowchart showing the steps in a manufacturing process, such as the raw materials, production, and quality control.
   3. A flowchart showing the steps in a computer program, such as the input, processing, and output.
   4. A flowchart showing the steps in a business process, such as the customer service, billing, and payment.
   5. A diagram showing the parts of a machine and their functions, such as a car engine or a washing machine.
   6. A diagram showing the steps in the operation of a machine, such as the sequence of movements or the flow of materials.
   7. A diagram showing the steps in a medical procedure, such as surgery or a diagnostic test.
   8. A diagram showing the steps in a cooking recipe, such as the ingredients, equipment, and cooking times.
   9. A diagram showing the steps in a DIY project, such as the tools, materials, and instructions.
   10. A diagram showing the steps in a safety procedure, such as an evacuation plan or a fire drill.
10. A diagram or illustration of a concept or idea, such as a model of the atom or a diagram of the water cycle. This will test the device's ability to represent abstract concepts and convey their relationships to one another.
    1. A model of the atom, showing the arrangement of protons, neutrons, and electrons.
    2. A diagram of the water cycle, showing the evaporation, condensation, and precipitation of water.
    3. A diagram of the carbon cycle, showing the movement of carbon through the atmosphere, oceans, and biosphere.
    4. A diagram of the nitrogen cycle, showing the conversion of nitrogen between different forms by bacteria and other organisms.
    5. A diagram of the cell cycle, showing the stages of cell growth and division.
    6. A diagram of the food chain, showing the transfer of energy between different levels of the ecosystem.
    7. A diagram of the human brain, showing the different regions and their functions.
    8. A diagram of the solar system, showing the positions and movements of the planets.
    9. A diagram of the periodic table, showing the properties of the different elements.
    10. A diagram of a physical or chemical process, such as the reaction between two substances or the formation of a crystal.

Here are 10 interactive demos that could be used to take in user input and display tactile graphics to the blind, along with brief descriptions of how they could be implemented:

1. A quiz game that tests the user's knowledge of a particular topic, such as math or science. The user could input their answers using a braille keyboard, and the device could display the correct answers and feedback using tactile graphics.
2. A puzzle game that requires the user to rearrange pieces or solve a problem using spatial reasoning. The user could input their moves using a braille keyboard, and the device could display the current state of the puzzle using tactile graphics.
3. A drawing or coloring tool that allows the user to create their own designs or pictures using braille input. The device could display the user's creations using tactile graphics.
4. A virtual reality game or simulation that allows the user to explore a virtual environment or perform tasks using braille input. The device could display the virtual environment or objects using tactile graphics.
5. A music or audio editing tool that allows the user to create their own compositions or modify existing audio using braille input. The device could display the audio waveform or other features using tactile graphics.
6. A text editor or word processor that allows the user to input and edit text using a braille keyboard. The device could display the text and formatting using tactile graphics.
7. A calculator or math tool that allows the user to input and solve equations or perform calculations using braille input. The device could display the results and intermediate steps using tactile graphics.
8. A translation tool that allows the user to input and translate text from one language to another using braille input. The device could display the translated text using tactile graphics.
9. A weather forecasting tool that allows the user to input their location and get current and future weather forecasts using braille input. The device could display the forecasts using tactile graphics.
10. A news or information aggregator that allows the user to input their interests and get updates on news or topics of interest using braille input. The device could display the updates using tactile graphics.