



POLICE QUAD

GAME OVERVIEW

&

CHAPTER 1: <name pending>

Detailed Functional Design Document v 3.3

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SECTION 1: POLICE QUAD GAME

Game Overview

In this game, the player plays the role of an alien, Geo, who is a police officer. She has the distinction of being the first alien on earth to be appointed to the police force. Rational thinking is her strength, and she is driven by a strong sense of justice. In the game, her purpose is to solve crimes and close as many cases as possible, but all the while also fighting to make the world a safer and better place for both humans and aliens.

In her avatar as Geo, the player needs to use deductive reasoning to solve different cases - presented as different chapters/puzzles, involving the alien settlers on earth, and sometimes humans. While playing the game, the player develops an understanding of the properties of shapes, shape classes, and properties and relationships of special quadrilaterals. In the process, she moves through various chapters solving different cases, earning stars for solving cases with accuracy and consistency. As she moves across the levels of the game, she also earns commendations and professional rewards - rising from the local police force to become a respected officer of a special international police force.

Characters and Setting

The game is set in the future, with the player-protagonist Geo as a police officer, who also happens to be an alien. Geo's family comes from the planet Planus, which is inhabited by multiple species of aliens. Planus is ruled by an evil and bigoted dictator, who ill-treats those who belong to a species other than his own. The story begins 10 years in the future, when Geo's family manages to escape Planus along with many others of their kind, the Judics, and take refuge on earth.

The Judic settlers appear quite different from humans, and each of them has an identification mark on them, which is in the shape of a particular 2-D shape. These shape-markers are unique, much like human thumbprints - and are the only way to tell them apart. The Judics are also characterized by their strong powers of reasoning.

The Judics start dwelling on earth and manage to find some acceptance, but there are still many humans who consider them 'outsiders', and pretty much think that all of them are a bad lot, sent to earth *just* to cause trouble for humans. Even as their struggle for acceptance and justice continues, the Judics often find themselves discriminated against, including by those responsible for maintaining the law. But there are also many on Earth who champion the cause of equality and justice for the Judics.

At the start of the game, the player-protagonist picks an avatar for her role of the police officer, Geo. The action begins in an imaginary town, where the player has just joined the police force. In playing the game, the player goes through several 'Chapters', that are different puzzles in varied settings or 'scenes' where the action takes place.

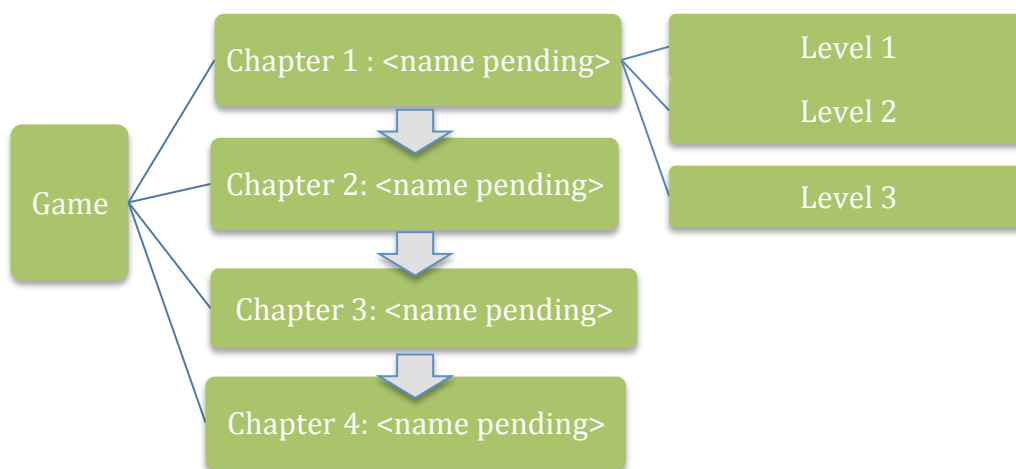
Starting with Chapter 1, which is set in the town (spoken of earlier), the player moves to more complex challenges and other Chapters, where the action gradually shifts to a much

larger stage. In the ultimate challenge in the game, the evil dictator attempts to forcibly take as many Judic earth-settlers back to Planus as possible, to be tried as criminals. If the player manages to foil this attempt, she would also ensure that the dictator is unable to go back to Planus, thereby making way for a new system there.

Chapter, Levels, and Stages

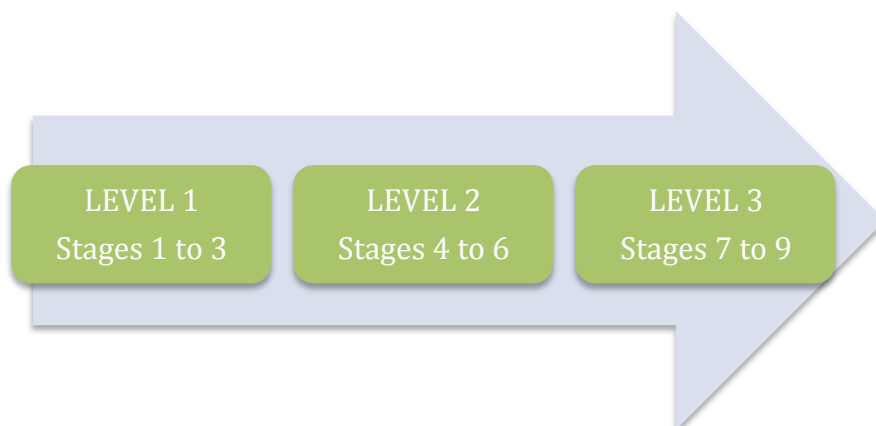
In moving forward in the game, the player-protagonist moves through different *Chapters*. The Game has four chapters. Each *Chapter* is in a different setting and has different features and gameplay, and multiple levels of complexity within it.

Within each Chapter, the player moves to progressively higher '*Levels*'. Currently, each Chapter consists of 3 Levels. These '*Levels*' are further broken down into '*Stages*' of increasing complexity. To move through a particular '*Level*' and get to the next one, a player is taken through these stages,



Chapters & Levels

In each successive '*Stage*' within a Level, some elements are added (either content-wise or logic-wise) to increase complexity. That is, from one stage of a chapter to the next, the complexity increases either in terms of the geometric concepts/ideas, or reasoning, or both.



Levels and Stages of Chapter 1

The stages have relevance pedagogically, and for collecting data at the backend. To the player, the Stages are not made visible at all, though crossing of *Levels* is made visible and rewarded.

Each 'round' played in a Chapter is referred to as a '*case*'.

Avatars and Rewards

A player starts at a beginning level rank in the local police force. Before starting the game, the player chooses an avatar that she likes. Three different kinds of rewards are used in the game for motivation. These are:

- *Points* - earned for each case, calculated based on how well that particular case is played. Points are a measure of effort, and do not indicate how well the player is doing.
- *Stars* - earned for cases solved correctly with no errors in the first attempt. Stars are the reward for playing the game with consistency.
- *Professional Honours* – in the form of promotion in the ranks earned when a Level of the game is cleared successfully. Clearing Levels and earning ranks is the true indication of progress and learning in the game.

The section on *Points and Rewards* has a detailed discussion on the reward system for the game.

SECTION 2: CHAPTER 1 (name pending)

Overview

In this initial Chapter, the player-protagonist, having recently joined the police force as a Sub-Inspector of Police, finds that he has a superior officer – an Inspector, with a reputation of being not very smart, and a little lazy.

There has been a case of rash driving, and the vehicle involved in the case has been traced to a building where a group of Judics reside. One of them is definitely the culprit. There are eyewitness accounts providing clues about the identity of the driver, but the Inspector is unable to figure it out. Being under pressure to arrest someone for the crime, he simply arrests all the Judics living in the building, in the hope that the culprit would confess. But even after spending one day in jail, no one has confessed, and pressure is mounting from Alien Rights Activists on the Inspector to release the innocent Judics!

Finding the Inspector very worried over this matter, Geo offers help. (She is driven by a very strong sense of justice and can't bear to see the innocent being held in jail.) There are clues about the culprit's identity in the eyewitness accounts. Based on these clues, Geo manages to identify the culprit, and release all the innocent Judics –much to the Inspector's relief.

But being rather foolish, the Inspector makes the same folly again and again, failing to identify the culprit from the clues, and shutting innocent Judics up in jail.

It is up to Geo, every time, to eliminate all the Judics who don't fit the bill, and narrow the suspect pool down to one – the culprit. The clues pertain to the unique shape markers that the Judics have, and the *suspect grid* displays these shape markers.

The *clues* appear one by one to the player – one at each step. With each clue, the player must decide which suspects to keep and which to eliminate. The innocent must not be kept in jail, and anyone who does not have the required property must be released immediately. If the makes an incorrect choice in a step – either by way of eliminating one or more shapes that fit the bill, or failing to eliminate some shapes that need to be, she gets a penalty which is also an indication that an error is made. Thus, the player goes through a systematic process of elimination, till all the innocent are set free and only the guilty Judic is left in jail.

There is an onscreen *Toolkit* with three tools provided to help the player to check for a certain property in case she finds it difficult to decide whether a particular shape has that property or not. The tools are – the Equal Sides Tester, the Right Angle Tester and the Parallel Lines Tester.

There is also support provided to help the player revisit some terms that they may be uncertain about. This is done through clickable hyperlinks on some key terms - which are linked to a *Glossary*, providing a brief visual explanation of the term.

Levels and Stages of the Chapter

Starting with only a few properties in the early Levels, more and more properties are introduced as the player progresses through the stages of the chapter. In the higher stages, the number of shapes in the suspect pool increases too, therefore making more clues mandatory to solve the case,

The attributes to be introduced and used in each stage, and details of other factors and qualifiers are provided in tables 1a, 1b and 1c below.

Table 1a

Property	Level 1			Level 2			Level 3		
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8	Stage 9
straight sides (number)	intro	y	y	y	y	y	y	y	y
curved side (yes/ no)	intro	y	y	y	y	y	y	y	y
sides equal (number) <u>OR</u> pairs of equal sides (number)	intro	y	y	y	y	y	y	y	y
right angle (yes/ no)	-	intro	NA	NA	NA	NA	NA	NA	NA
right angle (number)	-	-	intro	y	y	y	y	y	y
obtuse angle (yes/ no)	-	-	-	intro	NA	NA	NA	NA	NA
obtuse angle (number)	-	-	-	-	intro	y	y	y	y
acute angle (number)	-	-	-	-	-	intro	y	y	y
pair(s) of sides parallel (number)	-	-	-	-	-	-	intro	y	y
reflex angle (yes/ no)	-	-	-	-	-	-	-	intro	NA
reflex angle (number)	-	-	-	-	-	-	-	-	intro

Table 1b

Quantifiers	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8	Stage 9
exactly	y	y	y	y	y	y	y	y	y
more than*	y	y	y	y	y	y	y	y	y
less than*	y	y	y	y	y	y	y	y	y
at least*	y	y	y	y	y	y	y	y	y
at most*	n	n	n	n	n	n	n	y	y

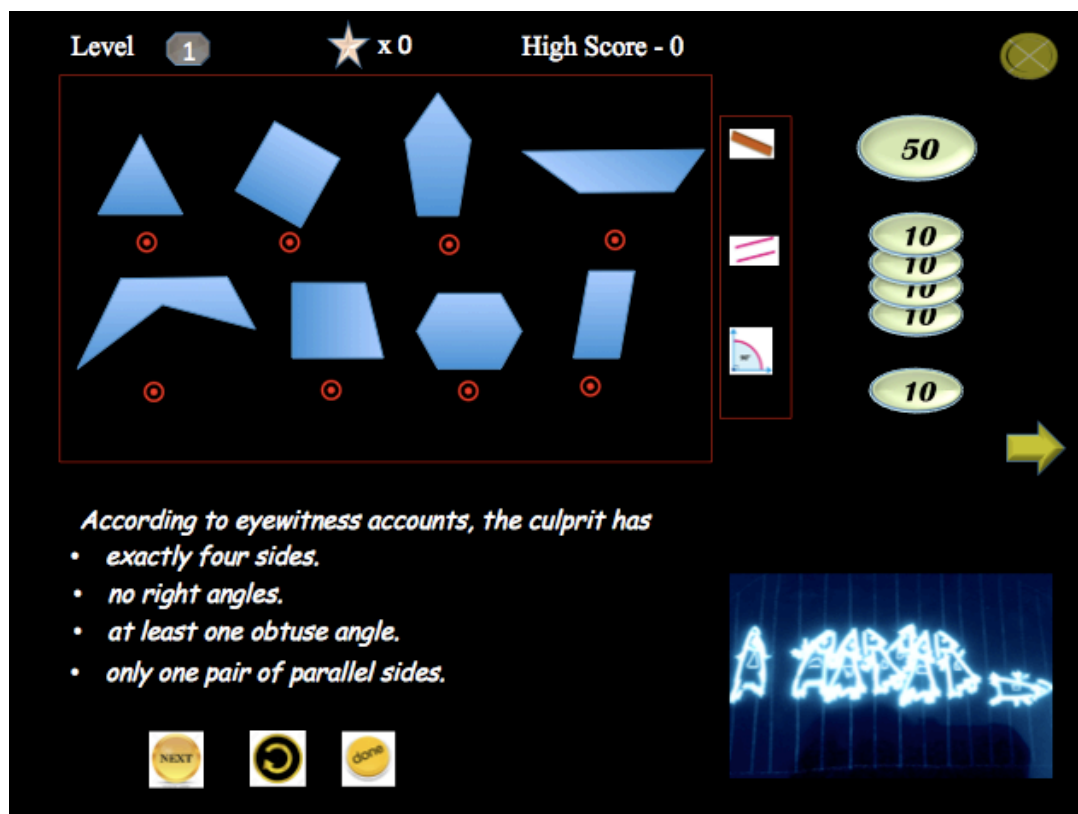
* The four quantifiers [more than, less than, at least, at most] are NOT used in clues pertaining to pairs of equal sides, and pairs of parallel sides.

Table 1c

Factor	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8	Stage 9
Orientation (original shapes can be turned)	-	-	y	y	y	y	y	y	y
Number of shapes in Suspect Grid	4	4	4	6	6	6	6	6	6

Schematic Layout

A very rough schematic layout of Chapter 1 is presented here. This is only a rough representation of the screen elements, and does not represent color or graphic design, size or location of items¹ on the screen, which is to be determined during design and development of the puzzle.



¹ The item on the bottom right, the police room scene, need not be on the screen during gameplay if too complex to do, but could be part of the lead up story. When a case ends, the same scene could be shown with only a single alien inside the cell.

Screen Elements

The table below describes the screen elements of Chapter 1, as shown in the schematic layout above. Detailed information about the functionality of these screen elements is provided in later sections.

Element	Notes
Suspect Grid	<p>The <i>Suspect Grid</i> displaying the shape-markers of the arrested suspects is one of the two major onscreen elements in this chapter. At the start of every 'case' that is to be solved, a pool of shapes (representing the shape-markers that hold the key to the identity of the Judics) is generated in the Suspect Grid. Each shape has some predefined properties that are linked to the clues that are generated. For each case, there is exactly one culprit.</p> <p>Earlier stages of the chapter have fewer shapes in the Suspect Grid and higher levels have more (see Table 1c).</p> <p>Every shape has a red cross mark below it, to select or deselect it. Clicking once on this button deselects the shape, and clicking again re-selects it. When deselected, the word 'Innocent' appears on the shape. At any step, all the deselected shapes are eliminated from play when the 'Next Clue' button is pressed.</p> <p>The word 'Released' appears as a watermark on each shape that is eliminated. A shape cannot be re-selected once it is released.</p>
Clues	<p>The second major onscreen element in this Chapter is the set of <i>Clues</i>. Each clue is a property that the culprit (and possibly some of the other shapes in the Suspect Grid) has. The player is required to evaluate every shape (remaining in the Suspect Grid) based on the clue given in a step, and release those that don't fit. This process of elimination is continued till the player narrows down successfully to leave just one shape in the grid.</p>
Toolkit with tools	<p>The toolkit on the screen allows students to check for certain properties when in doubt. There are three interactive tools in the toolkit.</p> <ul style="list-style-type: none">• The Equal Side Marker – Clicking on this tool icon activates a tool that allows the player to check for equal sides in a shape• The Right Angle Tester – Clicking on this tool icon activates a right angle tool that the player can manipulate to estimate the measure of the angle at that point as being equal, less, or more than a right angle• The Parallel Lines Tester - Clicking on this tool icon activates a parallel line tool that the player can manipulate to check whether two sides of a shape are parallel <p>Details about the functionality of the tools are explained in the section <i>Using the Toolkit</i>.</p>
Token Counter	<p>The token counter contains some tokens to be claimed for every new case played. Every error made by the player costs a token. At</p>

	the end of a case, the points earned are calculated based on the tokens remaining on screen.
Action buttons	<p>There are three action buttons that offer three different courses of action to the player while playing a case.</p> <ul style="list-style-type: none"> • 'Next' button - Clicking on this button eliminates the shapes chosen in that step and generates the next clue. This button works as long as two or more shapes remain in the Suspect Grid. • 'Done' button - Clicking on this button (at any point of time in a case) signals the closing of the case. • 'Replay' button - Clicking on this button allows the player to replay the same case from the start one more time.
Police room scene ²	<p>A glimpse of the room is provided on screen to help the player make the link between the story and the game. The player's avatar (with perhaps the rank displayed on the table in front) is displayed in the scene.</p> <p>The group of aliens shown huddling together inside the cell could visually become smaller and smaller till just one remains.</p>
Glossary hyperlinks	<p>Explanations for some key terms that are anticipated that the player might want to refer to, appear in hyperlinked form in the clues. Clicking on these hyperlinked terms open a dialog box with a visual explanation of that term/concept.</p>

Other Elements (to appear for all Chapters)

Next Case button	Clicking on this button after closing a case takes the player to a new case
Game Progress	A visual display indicating the player's progress in the game.
Stars tally	A 'perfect solution' - any case that the player solves in the very first attempt, without any error, earns her a certain number of stars. The stars tally (cumulative across chapters ³) is displayed on the screen at all times..
High Score	Points are scored every time a new case is attempted. The maximum points scored in a case (during a particular session), is displayed on screen as the high score.
Back button	Takes player back to the main menu, which offers options like choosing a chapter and level or quitting the game.

Puzzle Play

Each round played at a particular stage of the chapter is a 'case' that the player solves. Every case starts with the appearance of a predefined number of shape-markers in the suspect

² See comment related to this item in the Schematic Layout section.

³ Perhaps, cumulative within a session in the first version, if cumulative across sessions is not possible.

grid, and the first clue on the screen. Puzzle play consists of making a definite identification of the culprit by narrowing down the suspect pool at each step by eliminating all the shapes that don't fit the given clue.

The clues appear on the screen one by one, and not all at one go. At every step, the player has to try and eliminate the correct set of figures based on *that* clue. To do this, she deselects ALL the shapes that don't match the culprit's description, and proceeds to press the 'Next Clue' button. When she has narrowed the pool down to one shape, she presses the 'Done' button. Pressing the Done button ends that particular case.

The 'Replay' button can be pressed any time during the gameplay to play the same case again.

There is also a 'Next Case' button on the screen that becomes active once the Done button is pressed in a particular case.

The player is allowed to use any tool from the Toolkit at any step, and as many times as she wants, to check for the presence or absence of some property. She could also refer to the Glossary as many times as she wants, by clicking on the terms that are hyperlinked.

The case ends when the player presses the Done button.

Opening of Case

- 1.1 At the start of each round, a pre-determined number of shapes is generated in the Suspect Grid, based on the number specified in 'Number of shapes' (Table 1c, under *Stages of the Chapter*).
- 1.2 The leading phrase 'The culprit's shape-marker has...' appears at the top of the area earmarked for the clues, with the first clue appearing under it. This appears along with the Suspect Grid at the opening.

Game Play

- 2.1 The player deselects the shapes that don't match the clue by clicking on the icon given below each shape-suspect. She can reverse her choice by clicking again to re-select the shape.
- 2.2 At each step, the player has three actions to choose from – press the Next Clue Button, the Replay button, or the Done button.
- 2.3 To release the set of shapes she has chosen for elimination in a step, the player presses the Next Clue Button. When the Next Clue Button is pressed, the next clue (if any remain) appears automatically on the screen. Different scenarios under which the Next Clue Button could be pressed are discussed in a later section.
- 2.4 When the Replay button is pressed, the same case is initiated again. Different scenarios under which the Reply button are pressed are discussed in a later section.
- 2.5 When the Done button is pressed, the case is considered closed and the Next Case button becomes active. A pop-up evaluates the player's choice (for culprit) and displays the points and rewards earned by her. Different scenarios under which the Done button are pressed are discussed in a later section.
- 2.6 At any point during the play, the player could choose to use the Toolkit or Glossary tools (described in later sections) available to her.

Using the Toolkit

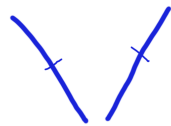
The Toolkit is placed on the screen and has three tools – the Equal Sides Tester, the Right Angle Tester and the Parallel Lines Tester. Each tool is represented by an icon, which could be understood intuitively.

On hovering the cursor over a tool, its name (such as 'Equal Sides Tester') should be displayed as a tooltip.

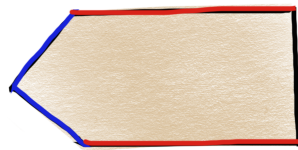
3.1 Equal Sides Tester

3.1.1 User interface

- The two segments of the Equal Sides Tester icon are equal. Sample icons shown below, though these do not represent color or graphic design, size or location of items on the screen, which will be determined during design and development of the puzzle.



tool icon



tool in action

3.1.2 Activating the tool

- Clicking on the Equal Sides Tester icon in the toolbox activates the tool and highlights this in some manner in the toolbox.
- All other tools, buttons, and functions on the screen are deactivated while the Equal Sides Tester is active.

3.1.3 Functioning of the tool

- The tool is 'draggable' to any point on the screen.
- The tool is 'droppable' only inside the suspect grid. If the tool is dropped at any point outside this area, it snaps back to its first position (near the toolbox).
- When it is dropped on top of, or very close to a side of any shape in the grid, The tool snaps to the side.
- Once the tool snaps to a side, the colour of that side changes. All other sides of that shape that are equal in length to this side, also get highlighted in the *same* colour.
 - Dragging the tool away from the initial chosen side unsnaps it from that side and frees it to be dragged to any other side of that shape or another shape.
 - Dropping the tool on another side of the same shape repeats the action for that side. (See sample in 'tool in action')
 - Dropping the tool on a new shape erases the colour changes in the previous shape.
- When the tool is active:
 - Clicking anywhere (inside/outside) the suspect grid does not result in any action.
 - Dragging and dropping the tool at any position inside the suspect grid (but not on a side), drops the tool at the new position.
 - If the student drags and drops the tool outside the suspect grid, it snaps back to the previous position inside the suspect grid.

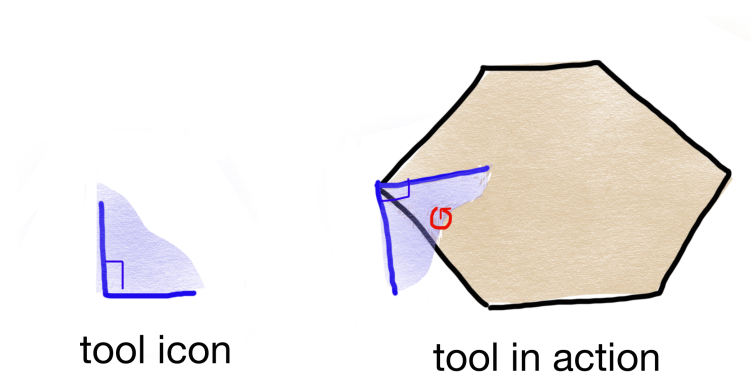
3.1.4 Deactivating the tool

- Clicking on the Equal Sides Tester icon (while it's active) deactivates the tool.
- Dragging and dropping the tool back to the toolbox also deactivates it.

3.2 Right Angle Tester

3.2.1 User interface

- The right angle tester's arms are equal, say 1.5 centimetres, in length. Sample icons shown below, though these do not represent color or graphic design, size or location of items on the screen, which will be determined during design and development of the puzzle.



3.2.2 Activating the tool

- Clicking on the Right Angle Tester tool icon generates the tool next to the toolbox – (which is in the form of a right angle) and highlights this in some manner in the toolbox.
- All other tools, buttons, and functions on the screen are deactivated while the Right Angle Tester is active.

3.2.3 Functioning of the tool

- The tool is 'draggable' to any point on the screen.
- The tool is 'droppable' only inside the suspect grid. If the tool is dropped at any point outside this area, it should snap back to its first position (near the toolbox).
- If the tool is dragged and dropped in the proximity of a vertex of any shape in the grid, it snaps to that vertex.
- An icon for rotation is visible just outside the right angle tool. Clicking and holding on the icon rotates the tool. Releasing the hold freezes the tool at that position. Dragging should be disabled when the pointer is on the rotate icon.
- Dragging and dropping the tool on another vertex of that shape, or any other shape in the grid, provides the same functions.
- When the tool is active:
 - Clicking anywhere (inside/outside) the suspect grid does not result in any action.
 - Dragging and dropping the tool at any position inside the suspect grid (but not near a vertex), drops the tool at this new position.
 - Dragging and dropping the tool outside the suspect grid snaps it back to the previous position inside the suspect grid.

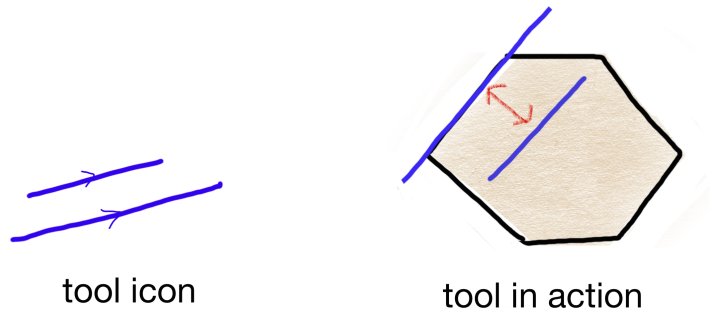
3.2.4 Deactivating the tool

- Clicking on the Right Angle Tester tool icon (while the tool is active) deactivates it, and displays the toolbox icons in their original form.
- Dragging and dropping the tool back to the toolbox also deactivates it.

3.3 Parallel Lines Tester

3.3.1 User interface

- The tool icon needs to be like a parallel line model, with one line longer than the other. Sample icons shown below, though these do not represent color or graphic design, size or location of items on the screen, which will be determined during design and development of the puzzle.



3.3.2 Activating the tool

- Clicking on the Parallel Line Tester tool icon turns the tool active and highlights this in some manner in the toolbox.
- All other functions/buttons on the screen are deactivated while the parallel line tester is active.

3.3.3 Functioning of the tool

- When the tool is dragged and dropped on any straight side of a shape, one of the parallel lines (longer one) snaps to the side of the shape. Simultaneously, a 'slider' icon (with arrows), becomes visible between the snapped and the free lines of the tool.
- Clicking on the two arrowheads of the slider icon slides the free line in a motion parallel to the snapped line (in the direction of the arrow). The motion of the sliding line is limited within the image grid.
- Dragging the tool unsnaps it from the side of the shape and frees it to snap to any other side of the same shape or a different shape.
- When snapping to a new side, the information provided during the previous snapping vanishes.
- When the tool is active:
 - Clicking anywhere (inside/outside) the suspect grid does not result in any action.
 - Dragging and dropping the tool at any position inside the suspect grid (but not near a vertex), drops the tool at this new position.
 - Dragging and dropping the tool outside the suspect grid snaps it back to the previous position inside the suspect grid.

3.3.4 Deactivating the tool

- Clicking on the Parallel Line Tester tool icon (while it's active) deactivates the tool and displays the toolkit icons in their original form.

- Dragging and dropping the tool back to the toolbox also deactivates it.

4. Using the Glossary

- 4.1 Whenever the player encounters a key term that she is unfamiliar with or uncertain about, she could click on it to check its meaning (some key terms will be hyperlinked). This will open a dialog box on the screen that shows a visual explanation of the term requested.
- 4.2 The rest of the screen will be disabled while this dialog box is open.
- 4.3 The player can proceed with the game after closing this dialog box.

Clue Generation Logic and Constraints

1. The number of clues needed for elimination should be
 - a. 2-3 for Level 1
 - b. 4-5 for Level 2 and Level 3
2. There should not be any clues that do not eliminate *any* shape. (This should take care of point 3, but still mentioned separately)
3. There must be no redundant clues. For instance, if the 3rd clue is 'less than 3 straight sides', then any successive ones can't be 'less than [4/5/6] straight sides'.
4. If a NEW property is introduced in particular a stage, there must be AT LEAST one clue regarding that property in that stage.
5. Quantifiers like 'at least' and 'at most' must not come in combination with 'PAIR of parallel/equal sides' in any clue.
6. There should not be more than two clues pertaining to the same attribute - that is, if there are two clues already about the number of right angles, there should not be a third clue about it.
7. The quantifiers 'at least' and 'at most' to not appear more than once in a particular case.
8. The clues that appear earlier on in a case should eliminate fewer shapes, and the clues that appear later should eliminate more.

Points and Rewards

Three kinds of rewards are awarded to the player – Points, Stars and Professional Honours. These are described in the section below.

Points

Points are meant to reward effort. At the closing of each case, points are awarded. No points are awarded for incomplete cases.

Every case starts with a fixed number of tokens on the Token Counter. The tokens are of a certain denomination. The number of tokens available and their denomination change with Levels.

There is also a special token called the 'Bonus Token', reserved for a 'Perfect Solution' – when the culprit is identified correctly in the first attempt, with NO errors along the way. The total points earned at the end of a case are calculated on the basis of the tokens preserved in the Token Counter. The scoring of points based on Tokens is described below.

Scoring of Points

- Every step in which an error is made, costs a token, and it is taken away from the counter.
- The Bonus Token is taken away with the very first error.
- When the player presses the 'Done' button to end a case, the points scored for that case is computed according to the table shown below.

(End of Case) Points Calculation Table

	LEVEL 1 (all stages)	LEVEL 2 (all stages)	LEVEL 3 (all stages)
Token (t)	Denomination – 10	Denomination – 20	Denomination – 30
(n)	Number available - 4	Number available - 6	Number available - 6
Bonus** Token (b)	Denomination – 50	Denomination – 100	Denomination – 150
	Number available - 1	Number available - 1	Number available 1
Score Computation	$(t \times n) + (b \times 1)$	$(t \times n) + (b \times 1)$	$(t \times n) + (b \times 1)$
Perfect Score	90	220	330
(**No bonus token available in replay mode)			

At any point of time during a game, max points scored in a case during *that particular session* is displayed on the screen as the *High Score*

Stars

Stars are awarded for perfect solutions - a case that is solved in the very first attempt without *any* error. In Chapter 1, one star is earned for each perfect solution.

	LEVEL 1 (all stages)	LEVEL 2 (all stages)	LEVEL 3 (all stages)
Stars earned for each perfect score	1	1	1

Professional Honours

In this chapter, the stage is limited to the local police force in the imaginary town. Hence professional growth is within the local police force. After crossing Level 1, the player is promoted to the rank of an Assistant Inspector Inspector of Police from Sub-Inspector.

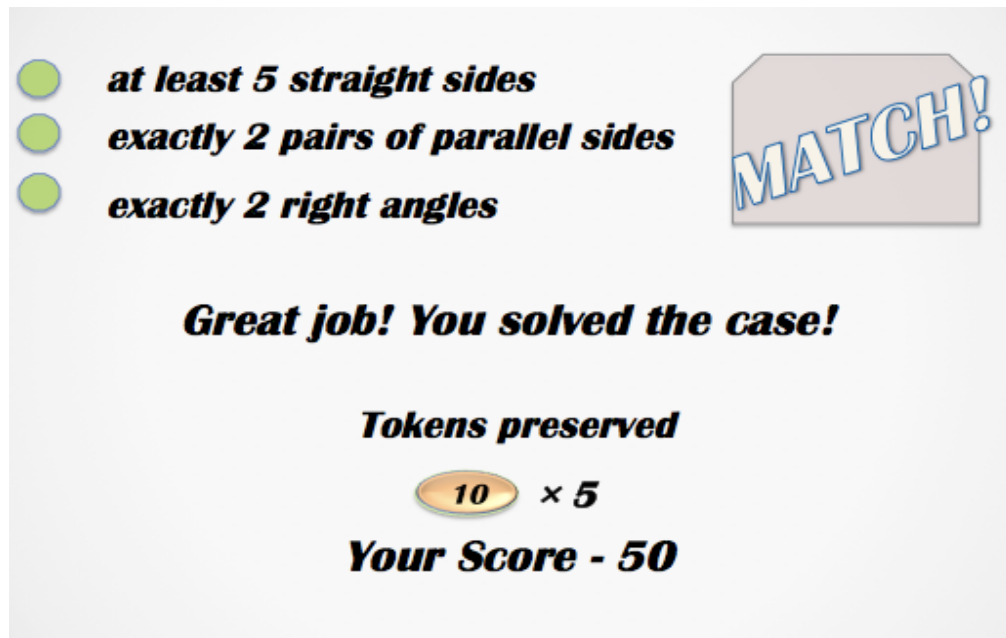
	Starting rank	At the end of LEVEL 1	At the end of LEVEL 2	At the end of LEVEL 3
Rank earned	Sub Inspector	Assistant Inspector	Inspector	Assistant Commissioner of Police

After crossing Level 3 (end of Chapter 1), the player grows to become the first Judicial gazetted officer – the Assistant Commissioner of Police.

The player's rank is linked to the *highest level* reached in the game. If the player chooses to play earlier levels again, it would not affect her rank (already earned) in any way.

On earning a professional reward in the form of a promotion, the player's avatar changes according to the new rank.

Sample Case Evaluation Pop-up



Sample 1: Correct Solution with 5 tokens preserved

-  **at least 5 straight sides**
-  **exactly 2 pairs of parallel sides**
-  **exactly 2 right angles**



Perfect! You've earned this: 

Tokens preserved


50 +
 
10 × 5

Your Score - 100

Sample 2: Perfect Solution

User Action and Functionalities

User Action	Condition	Functionality	Graphics/Audio/Text
Click on Next Clue Button	When 1 or more clues remain	The shapes chosen for elimination in that step (already faded out) are eliminated from further play, and the next clue is generated	<p>The watermark 'Released' appears on the newly eliminated shapes.</p> <p>The new clue is displayed below the previous clue.</p>
Click on Next Clue Button	When no more clues remain	No action	<p>Display text message: "There are no more clues!"</p> <p>Possible animation: The officer figure in the police room shuts the case file and scratches his head.</p>
Click on Replay Button	(At any point during a case)	Initiates the same case again	The same case appears on the screen from the start.

Click on Done ⁴ Button	When all clues are exhausted, and only <i>one</i> shape left in grid <u>and</u> Culprit identified correctly	Releases the shapes selected for elimination, and then ends the case and provides end of case evaluation	Display evaluation of solution followed by text message: 'Great job! You solved it!'
Click on Done Button	When all clues are exhausted, and only <i>one</i> shape left in grid <u>and</u> Culprit is NOT identified correctly	Releases the shapes selected for elimination, and then ends the case and provides end of case evaluation	Display evaluation of solution followed by text message: 'Oops! That is not the culprit - better luck with the next case!'
Click on Done Button	When all clues are exhausted, but more than one shape left in grid	Releases the shapes selected for elimination, and then ends case and provides 'Unsolved Case type 1' feedback	Display text message: 'Oops... you did not release all the innocent guys! Better luck with the next case!'
Click on Done Button	When all clues are exhausted, but no shape is left in grid	Releases the shapes selected for elimination, and then ends case and provides 'Unsolved Case type 2' feedback	Display text message: 'Oops... looks like you released the culprit too! Better luck with the next case!'
Click on Done Button	When all clues are not exhausted	Releases the shapes selected for elimination, and then ends case and provides 'Incomplete Case' feedback	Display text message: 'Don't be in a hurry - next time, check <i>all</i> the clues first!'
Click on Next Case Button	When gameplay is over (once Done button is pressed)	Initiates the next case on screen	Button changes from 'disabled' state to 'active' state
Click on Next Case Button	When gameplay is on (before Done button is pressed)	No action	-

⁴ When the player is on the last clue, pressing the 'Done' button should eliminate the selected shapes, and *then* display the end of case evaluation.

Success at a Stage

To clear a particular *stage* of the chapter and go on to the next, the player must solve *one* case successfully in the first attempt (a case solved correctly in 'Replay' mode does not count).

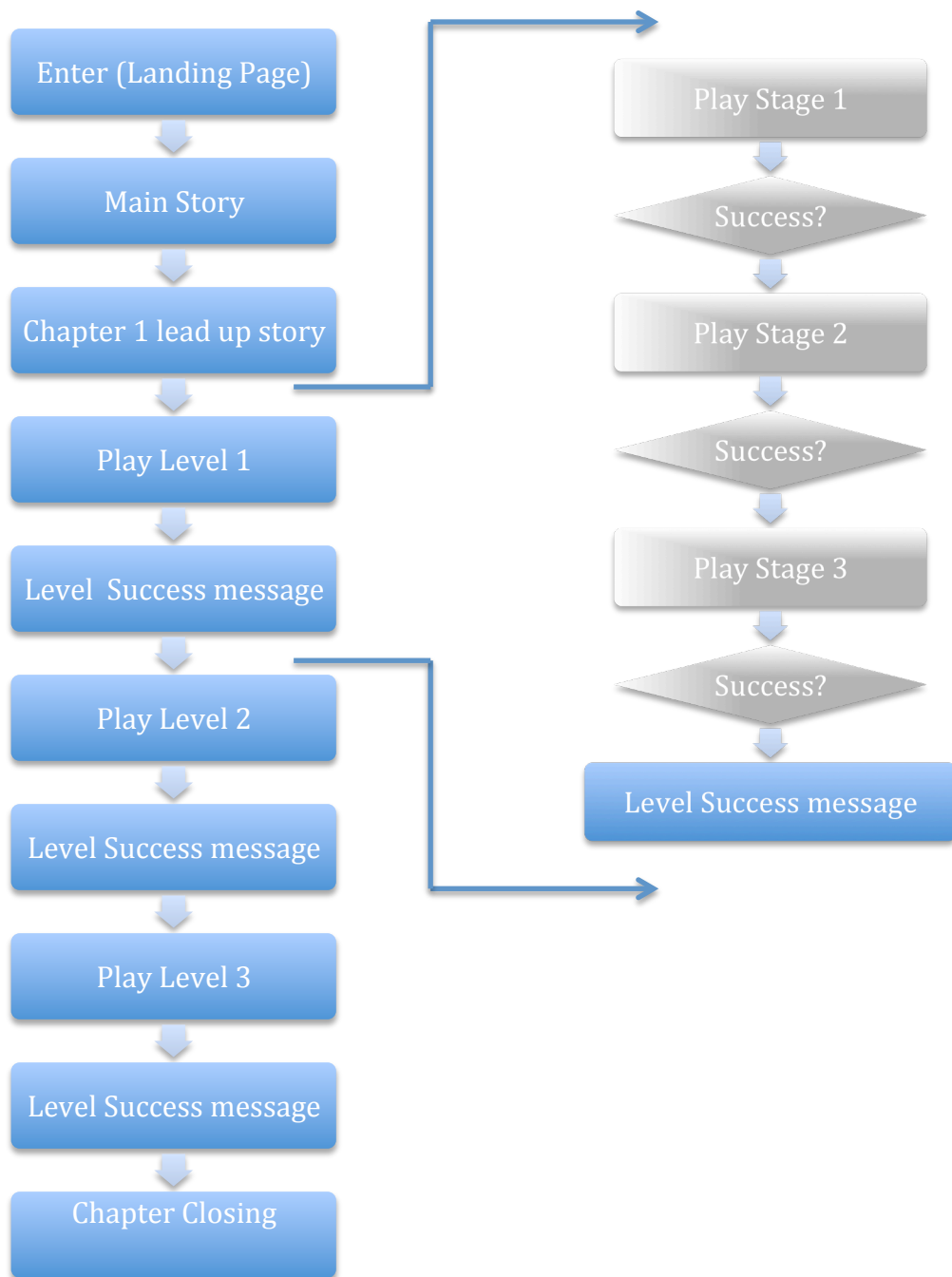
Progress from one stage to another is seamless for the player, and she does not see anything explicitly on the screen to tell her she is crossing stages.

Success at a Level

When the player crosses the *highest Stage* of a level successfully, she is considered to have cleared that *Level*. Success at a level is accompanied by a promotion – a change in the player's rank. (See table in the Professional Honours section.)

Also see Chapter Flow Logic in the next page.

The Chapter Progress Logic defines how students are expected to move ahead in the game in its ideal form. However, for the first version, it might be necessary to allow the student to go back to the main menu page and select whichever Level they desire to play. Initially, only Level 1 would be unlocked. Once Level 1 is 'cleared' (based on the criteria that have been pre-defined), Level 2 is unlocked, and so on. It might also be necessary to provide the teacher a simple means of resetting the Game.



Chapter Flow Logic