



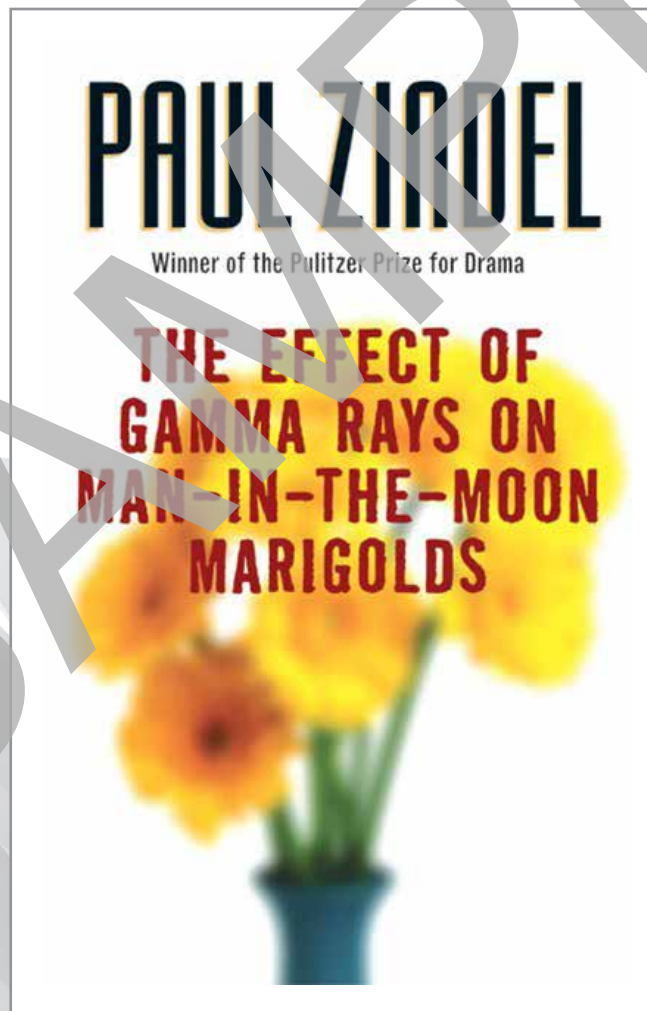
**TEACHER GUIDE**

**GRADES 9-12**

COMPREHENSIVE CURRICULUM BASED LESSON PLANS

# **The Effect of Gamma Rays on Man-in-the-Moon Marigolds**

Paul Zindel



**READ, WRITE, THINK, DISCUSS AND CONNECT**

# The Effect of Gamma Rays on Man-in-the Moon Marigolds

Paul Zindel

## TEACHER GUIDE

**NOTE:**

The trade book edition of the novel used to prepare this guide is found in the Novel Units catalog and on the Novel Units website. Using other editions may have varied page references.

Please note: We have assigned Interest Levels based on our knowledge of the themes and ideas of the books included in the Novel Units sets, however, please assess the appropriateness of this novel or trade book for the age level and maturity of your students prior to reading with them. You know your students best!

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3901 Union Blvd., Suite 155

St. Louis, MO 63115

[sales@novelunits.com](mailto:sales@novelunits.com)

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# Table of Contents

|  |    |
|--|----|
| <b>Plot Summary</b> .....  | 3  |
| <b>Background on the Novelist</b> .....  | 4  |
| <b>Initiating Activities</b> .....   | 4  |
| Topics for Discussion, Prediction, Book Hook,<br>Anticipation Guide, Log, Verbal Scales,<br>Brainstorming, Role Play, Debate, Prereading<br>Vocabulary Activity, Novel Detective |    |
| <b>Vocabulary, Discussion Questions,<br/>Writing Ideas, Activities</b>   |    |
| Act I, Pages 1-21 .....  | 10 |
| Characters, The Setting  |    |
| Act I, Pages 21-39 .....   | 14 |
| Stage Directions   |    |
| Act I, Pages 39-58 .....   | 16 |
| Atmosphere   |    |
| Act I, Pages 58-67 .....   | 19 |
| Conflict   |    |
| Act II, Pages 71-90 .....  | 21 |
| Foreshadowing  |    |
| Act II, Pages 91-108 .....   | 24 |
| <b>Post-Reading Extension Activities</b> .....   | 27 |
| <b>Extension/Assessment Activities</b> .....   | 29 |
| These activities may be used for assessment.   |    |

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## Plot Summary

The scene opens on the interior of a cluttered house where Beatrice—a bitter, disturbed woman—lives with her teenaged daughters, Tillie and Ruth, whom she constantly disparages. Beatrice has been earning some money taking elderly, infirm patients into her home. Her current patient, Nanny, shuffles in and out, oblivious to the sarcastic comments Beatrice makes about her (“Nanny is always ready for duty, aren’t you Nanny?”) and her daughter (“Miss Career Woman of the Year”). Ruth and Tillie are both social misfits of a sort. Traumatized by the ghastly death of one of her mother’s patients, Ruth was seen by psychiatrists, has recurrent nightmares, and is prone to seizures. Conspicuous in her ill-fitting clothes, Ruth enjoys picking up gossip by volunteering to work in the school office. She also enjoys getting her mother to retell the story of how Beatrice once took out the horses and wagon by herself when she was small. (Like the author’s grandfather, Beatrice’s father sold vegetables from a wagon.)

The play focuses on Tillie, whose love of science is the one bright spot in this family’s bleak environment. Although she has known what it is to be laughed at, she earns respect by doing a study on the effects of irradiation on marigold seeds. Her science teacher, Mr. Goodman, has apparently taken a personal interest in her. He has given her a live rabbit, phones her mother to let her know how well she is doing, and questions her sister about why Tillie is missing so much school. (Beatrice keeps her home to help around the house.) One day the principal calls to tell Beatrice that Tillie is a finalist in the science fair and to invite Beatrice to a special assembly. Tillie is mortified when Beatrice screams at the man over the receiver that she’ll “think about it.” Instead of congratulating Tillie, Beatrice complains that she has no clothes and will look as ugly as Tillie does. Still, Beatrice is actually proud and dresses up for the occasion.

Meanwhile, Ruth has discovered that her mother’s classmates used to call her “Betty the Loon.” Tillie gives her rabbit to Ruth in exchange for Ruth’s promise that she will not spoil their mother’s happiness by revealing what she knows. When Beatrice announces that Ruth must miss the assembly to stay home and take care of Nanny, Ruth gets back at her by calling her “Betty the Loon.” Enraged, deflated and broken, Beatrice sends the girls off in a taxi by themselves.

Despite her nervousness, Tillie beats her competition—smug Janice, who has skinned a cat and put the skeleton together—and gets the top prize. Meanwhile, Beatrice calls the school and leaves an angry message for Tillie’s teachers. Drinking heavily, she rips paper from the windows in preparation for one of her endless money-making schemes—starting a tea room. She calls Nanny’s daughter and orders her to come get her mother. Finally, she takes the rabbit upstairs and chloroforms it. Ruth and Tillie return home with the trophy, elated by Tillie’s success. When Ruth finds the rabbit, she has a convulsion. Beatrice gets Ruth onto a sofa, but refuses to allow Tillie to call a

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## Vocabulary • Discussion Questions Writing Ideas • Activities

### Characters, The Setting Act I Pages 1–21

#### Vocabulary

debarkation xii  
misbegotten 1  
detaining 7  
ferment 10  
ecstasy 17  
psoriasis 18

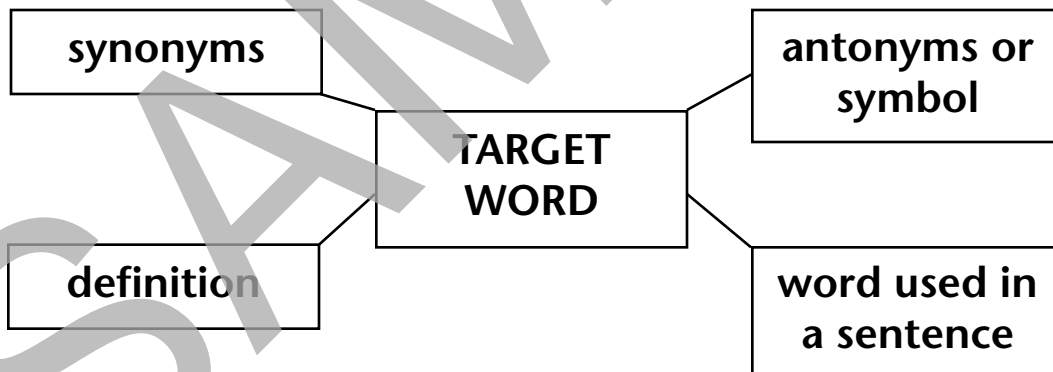
ventilation xii  
primeval 2  
effeminate 7  
chloroform 10  
leprosy 18  
gravely 18

balustrade xiii  
convulsive 6  
hermaphrodite 7  
rummages 11  
ringworm 13

evolved xiii  
advances 6  
radioactivity 9  
Gestapo 16  
gangrene 18

#### Vocabulary Activity

Word mapping is an activity that can be used with most words. (Students simply fill in a framework like the one below.) For words that have no antonyms, students provide a picture or symbol that captures the word meaning.



Have students work in cooperative groups to map the following words from this section:

detaining 7  
chloroform 10  
ringworm 18  
gravely 18

effeminate 7  
ecstasy 17  
gangrene 18

hermaphrodite 7  
leprosy 18  
psoriasis 18

(Allow time for groups to share their finished maps with each other.)

---

## Act I

### Pages 21-39

#### Vocabulary

|               |               |                |             |
|---------------|---------------|----------------|-------------|
| chamber 21    | flinging 22   | real estate 25 | gestures 25 |
| negotiates 26 | cataracts 26  | pervades 28    | tubular 28  |
| saccharine 29 | oblivious 30  | varicose 35    | rummages 37 |
| Angora 37     | silhouette 38 |                |             |

#### Vocabulary Activities

Give students these three options for small-group work:

- Create a crossword puzzle with the vocabulary words (using a piece of puzzle-making software, if you wish).
- Create “Jeopardy”-like statements for each word (e.g., “This type of rabbit or goat has hairs that can be made into soft yarn.”—“What is **angora**?”)
- Create a picture puzzle for each word. On one side of a card goes a drawing or cutout that represents the word. The player tries to guess the word (printed on the other side). For example, the “gestures” card might show a Cathy cartoon with Cathy gesturing to an office-mate.

After choosing and completing an activity, each small group gives their game to another small group to solve or play.

#### Discussion Questions

- What change is signified by the stage directions on page 21 (“Go to dark. Music in.”)? (Time has passed and the scene shifts from Ruth and Beatrice’s conversation to Tillie’s thoughts about the cloud chamber.) Have you ever seen a cloud chamber? How did the demonstration of the cloud chamber make Tillie feel? (She was awed by the idea that the atoms are ever-changing, never-ending.) Has anything ever made you feel that way?
- What happens before and after what is shown on page 23? (Tillie has been preparing seed boxes for an experiment on the effects of exposure to radiation; then she takes out her rabbit and listens to her mother complain about having the plants in the living room.) Does the illustrator capture Tillie’s mood? Do you think Dong Kingman’s illustrations enrich the story?
- What section of the paper is Beatrice reading? (real estate ads) Why? (She is thinking about how she could make money by starting a nursing home.) What sorts of money-making schemes has she considered? (real estate, beauty school, tea shop) Why do you suppose she hasn’t been successful at any of these?

- 
4. Who is Nanny? (an elderly woman in Beatrice's care) What is Tillie talking about when Nanny first appears in the story? (science—her experiment and the cloud chamber) Why do you suppose Zindel juxtaposed (placed side by side) the appearance of this elderly woman ("perhaps a century old") with the discussion of "half-lives"? (Both relate to the idea of aging, deterioration.)
  5. How does Beatrice seem to feel about Nanny? (resentful, condescending, disgusted) Do you think she resents taking care of her? Would she treat Nanny differently if Nanny were physically impaired, but mentally alert? How would you talk to someone like Nanny?
  6. Why does Beatrice call Nanny a "cross to bear"? (She considers Nanny a trial that has to be accepted.) Where do you suppose that expression comes from? (maybe from the bearing of the cross by crusaders) What have Beatrice's other patients been like? (all old—one with a brain tumor, one with cancer, one with worms in his legs) Do you think she developed affection for any of them? (seemingly not) What qualities do you think a caretaker should have? Why do you think Beatrice went into a line of work for which she seems so unsuited? Was it just the money—or does she really want to nurture old people?
  7. Why do you suppose Beatrice accuses Tillie of taking her "for a fool" (p. 34)? (Maybe she feels insecure because she doesn't have Tillie's understanding of science.) Does Tillie put her mother down? (no) Do you think Beatrice was as good a student as Tillie? How do you imagine her at that age? Do you think Beatrice really was "one of the most respected kids you ever saw" (p. 34), as she claims? Why does she say that she and cobalt-60 are "two of the biggest half-lives" (p. 39)? (Tillie is explaining that half of a quantity of cobalt will break down over a certain number of years; as usual, Beatrice directs the conversation back to her problems—in this case, her daughters, her widowhood, her messy house.)
  8. What is in the bottle Beatrice is keeping in the drawer? (chloroform) Why? (in case she wants to kill the rabbit) Do you think Tillie is alarmed? Would you be?
  9. Why does Beatrice say, "Speaking of manure machines, is Nanny ready to go make duty"? (Talking about the rabbit's defecation reminds her that Nanny may need to use the toilet.) Some people use humor to get through difficult situations; others sometimes use it at others' expense. Do you see anything wrong with Beatrice's joking? Do you think Nanny's daughter would leave her with Beatrice if she knew how Beatrice treats Nanny? (According to Beatrice, the daughter is only too anxious to get rid of her mother.)
  10. **Prediction:** Beatrice has said she will get rid of the rabbit and start a tea shop. Do you think she will follow through?

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## The Author's Craft: Stage Directions

Explain that **stage directions** are those instructions in a play, usually printed in italics, that suggest what the set looks like, how characters should gesture or move, and the tone of voice and facial expressions they should use. Actors do not speak these directions aloud as lines.

Have students point out some of the stage directions in this section and discuss what these directions add to the story. (e.g., The stage directions on page 29 suggest that Beatrice has no emotional connection with Nanny, and pretends to talk sweetly to her while being condescending.)

## Writing Activity

Reread Beatrice's description of Nanny's daughter, pages 32–33. Then write a short scene showing the day her daughter brought her to Beatrice. Include stage directions that describe the gestures and tones of voice used by Beatrice and the younger woman.

## Act I Pages 39–58

### Vocabulary

sterility 41

mutation 42

tragedy 42

accentuated 43

transmute 43

comic 46

sanatorium 54

thrombosis 55

tinsel 55

### Vocabulary Activity

Have students explain which word does not belong with the others—and why. (Answers are in italics; accept other answers, if defended.)

1. *utility*, sterility, fertility, progeny
2. radiation, mutation, DNA, *ecology*
3. tragedy, *tinsel*, comedy, calamity
4. emphasized, accentuated, highlighted, *transmuted*
5. comic, *comely*, comedian, comedienne
6. sanatorium, hospital, infirmary, *stadium*