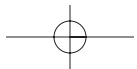
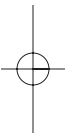
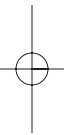


Movie Science



Other Books by Jim Wiese

Head to Toe Science

Over 40 Eye-Popping, Spine-Tingling, Heart-Pounding
Activities That Teach Kids about the Human Body

Roller Coaster Science

50 Wet, Wacky, Wild, Dizzy Experiments
about Things Kids Like Best

Rocket Science

50 Flying, Floating, Flipping, Spinning Gadgets
Kids Create Themselves

Detective Science

40 Crime-Solving, Case-Breaking, Crook-Catching
Activities for Kids

Spy Science

40 Secret-Sleuthing, Code-Cracking, Spy-Catching
Activities for Kids

Cosmic Science

Over 40 Gravity-Defying, Earth-Orbiting,
Space-Cruising Activities for Kids

Magic Science

50 Jaw-Dropping, Mind-Boggling,
Head-Scratching Activities for Kids

Movie Science

*40 Mind-Expanding, Reality-Bending,
Starstruck Activities for Kids*



Jim Wiese

Illustrations by Ed Shems



John Wiley & Sons, Inc.

New York • Chichester • Weinheim • Brisbane • Singapore • Toronto

Copyright © 2001 by Jim Wiese. All rights reserved
Illustrations © 2001 by Ed Shems

Published by John Wiley & Sons, Inc.
Published simultaneously in Canada

Design and production by Navta Associates, Inc.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning, or otherwise, except as permitted under Section 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 750-4744. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 605 Third Avenue, New York, NY 10158-0012, (212) 850-6011, fax (212) 850-6008, e-mail: PERMREQ@WILEY.COM.

The publisher and the author have made every reasonable effort to ensure that the experiments and activities in the book are safe when conducted as instructed but assume no responsibility for any damage caused or sustained while performing the experiments or activities in this book. Parents, guardians, and/or teachers should supervise young readers who undertake the experiments and activities in this book.

Library of Congress Cataloging-in-Publication Data:

Wiese, Jim

Movie science : 40 mind-expanding, reality-bending, starstruck activities / Jim Wiese.
p. cm.—(Jim Wiese science series)

Includes index.

ISBN 0-471-38941-2 (pbk.)

1. Cinematography—Juvenile literature. 2. Cinematography—Special effects—Juvenile literature. 3. Science projects—Juvenile literature. [1. Science projects. 2. Motion pictures. 3. Science—Experiments. 4. Experiments.] I. Title: Movie science, 40 mind-expanding, reality-bending, starstruck activities. II. Title.

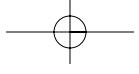
TR851 .W52 2001

778.5'3—dc21

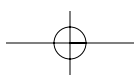
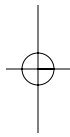
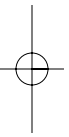
00-066263

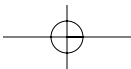
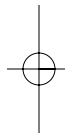
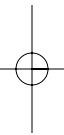
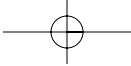
Printed in the United States of America

10 9 8 7 6 5 4 3 2 1



For Elizabeth and Matthew,
and all who share my love
of television and movies





Contents

Acknowledgments ix

Introduction i

- How to Use This Book 1
- Being a Good Scientist 2
- Increasing Your Understanding 2
- Using This Book to Do a Science Fair Project 2
- A Word of Warning 3

1 The Magic of Movies

How Movies Work 5

- Project 1: Pinhole Camera 7
- Project 2: Picture Perfect 9
- Project 3: Thaumatrope 12
- Project 4: Flip Book 13
- Project 5: Zoetrope 16
- Project 6: Moving Pictures 19
- Project 7: 3-D 20
- Project 8: Keep It in Perspective 23
- Project 9: Distorted Room 25

2 Making It Real

Props and Makeup 29

- Project 1: Rock On 30
- Project 2: Strange Reactions 32
- Project 3: Hidden Jewels 35
- Project 4: Animal Attraction 38
- Project 5: Blood Simple 40
- Project 6: Scabs 42
- Project 7: He Got Me! 44

3 Did It Really Happen?

Special Effects 47

- Project 1: Sound Effects 48
- Project 2: Fog in the Bog 52

Project 3: A Frosty Morning in July	54
Project 4: The Nailboard	55
Project 5: Lightning Strikes	58
Project 6: Twister!	60
Project 7: Computer Images	62
Project 8: Robot Hand	64
Project 9: The Strongest Human Alive	67
Project 10: Slow Mo	69

4 Helping the Camera

Light and Color 73

Project 1: Sunset	74
Project 2: What's Really There?	76
Project 3: Ghost Images	79
Project 4: More Ghostly Images!	81
Project 5: Addition by Subtraction	84
Project 6: Night and Day	87

5 Movie Science and Science Fiction

It's Truer Than You Think! 91

Project 1: Mission to Mars	92
Project 2: Making Contact	95
Project 3: Speed of Sound	98
Project 4: Worm Holes	100
Project 5: Tidal Forces	103
Project 6: Attack of the 15-Foot Baby	105
Project 7: Building Dinos	108
Project 8: The Man with X-Ray Eyes	110

Glossary 113

Index 116

Acknowledgments

I grew up in what many consider the Golden Age of television and the movies. My family was one of the first in our neighborhood to get an old black and white television, and I still remember inviting friends in to watch the early shows. I also remember taking the bus from my home to the downtown theaters every Saturday afternoon to watch the latest movies. Through both of these mediums I was transported to a world of fantasy that stimulated my imagination. I remember spaceships traveling to other planets and westerns where good always triumphed over evil. In those brief moments, I felt like I was really there. Little did I know that some of what I saw would later become a reality. In less than 20 years, humans did walk on the moon. And I still believe that good will eventually win over evil.

Years later, I was given the opportunity to work on the television series *MacGyver*. While on the set, I learned more about how special effects were used to enhance the story. A special thanks goes to story editor Rick Drew, Adrienne Allen, and executive producer Steven Downing, who let me see behind the scenes of a television series and helped me start an educational project with the help of Paramount Pictures, called *Super Science with MacGyver*.

There are many people who generously gave their time and experience to make this book happen. Foremost would be Scott Steynes. Scott both offered his inside knowledge and opened doors to his network of friends in the movie and television industry. Thanks, Scott.

Again, I would like to thank the team of people at John Wiley who worked to make this book a reality. I would especially like to acknowledge the work of my editor, Kate Bradford. Her professionalism in every aspect of the publishing process always brings out the best in my writing.

